FINAL

2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT

Joliet Army Ammunition Plant Will County, Illinois

Submitted to:



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ACRONYMS AND ABBREVIATIONS

ACSIM Assistant Chief of Staff for Installation Management

Army United States Army

BRK bedrock well

CERCLA Comprehensive Environmental Response, Compensation,

and Liability Act

cm/sec centimeters per second

CO₂ carbon dioxide

COC contaminant of concern

COMBO combined overburden/bedrock well

CSM conceptual site model

2,4-DNT 2,4-dinitrotoluene
2.6-DNT 2.6-dinitrotoluene

2-A-4,6-DNT 2-amino-4,6-dinitrotoluene

4-A-2,6-DNT 4-amino-2,6-dinitrotoluene

DO dissolved oxygen

DVR data validation report

February February/March quarterly sampling

ft foot/feet

ft/day feet per day
ft/ft feet per foot
ft/yr feet per year

FSP Field Sampling Plan

GMZ Groundwater Management Zone

GOU Groundwater Operable Unit

GRU Groundwater Remediation Unit

H₂O water

HMX High Melting-point Explosive

in. inch

IAC Illinois Administrative Code

IC institutional control

ID/IQ Indefinite Delivery/Indefinite Quantity

IEPA Illinois Environmental Protection Agency

J estimated concentration

JOAAP Joliet Army Ammunition Plant LAP Load-Assemble-Package area

LTM long-term monitoring

LTM Plan Final Long-term Monitoring Plan for Environmental

Remediation Services

MDL method detection limit

MFG manufacturing area
mg/L milligrams per liter
ml/min milliliters per minute

MNA monitored natural attenuation

MWH Americas, Inc.

MS/MSD matrix spike/matrix spike duplicate

NB nitrobenzene
ND not detected

NPL National Priority List

2-NT 2-nitrotoluene
OD outside diameter

ORP oxidation-reduction potential

OU operable unit
OVB overburden well

PVC polyvinyl chloride

QAPP Quality Assurance Project Plan

RA remedial action

RDX Royal Demolition Explosive

RG Remedial Goal

RI Remedial Investigation

ROD Record of Decision
SOU Soil Operable Unit

SpC specific conductivity

SQL Sample Quantitation Limit

SVOC semi-volatile organic compound

TAL target analyte list

TNB 1,3,5-trinitrobenzene
TNT 2,4,6-trinitrotoluene

TolTest, Inc.

μg/L micrograms per liter

USACE United States Army Corps of Engineers

USAEC United States Army Environmental Command

USDA United States Department of Agriculture

USEPA United States Environmental Protection Agency

VOC volatile organic compound

RJR/rjr/SGW

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1.0 INTRODUCTION

This report has been prepared by TolTest, Inc. (TolTest) in conjunction with teaming partner MWH Americas, Inc. (MWH), for environmental remediation services at the former Joliet Army Ammunition Plant (JOAAP) on behalf of the United States Army Environmental Command (USAEC) Assistant Chief of Staff for Installation Management (ACSIM) under Indefinite Delivery/Indefinite Quantity (ID/IQ) Contract No. W91ZLK-05-D0012, Delivery Order 0001.

This report presents the Spring 2012 (February/March [February] and April) groundwater quality data for the long-term monitoring (LTM) program of the Groundwater Operable Unit (GOU) and landfill inspection documentation for March and April inspections for the Soil Operable Unit (SOU) at JOAAP in response to the *Record of Decision for the Soil and Groundwater Operable Units on the Manufacturing and Load-Assemble-Package Areas* (U.S. Army, 1998), (ROD) for the JOAAP facility. The remedy that was selected for the GOU Sites at JOAAP was monitored natural attenuation (MNA). As a function of the MNA remedy for the Groundwater Remedial Units (GRUs), LTM is required. This requirement is intended to satisfy three primary objectives:

- 1. Monitor contaminant concentration reductions and plume migration;
- 2. Verify containment of contaminant concentrations greater than Remedial Goals (RGs) within the Groundwater Management Zones (GMZs); and
- 3. Evaluate the effectiveness of SOU remedial actions (RAs) and MNA for the GOU remedy.

These objectives are being met through implementation of the LTM program.

In addition to the GOU, the SOU remedial actions included the construction of three landfills at Sites L3, M11, and M13. Landfill inspections are required quarterly to determine if the remedy continues to function as designed. Post-closure inspection reports for March and April for landfills L3, M11, and M13 are included in Appendix A.

The objective of this report is to provide a data submittal of the groundwater quality sampling results, provide a review of the data collected during spring 2012, and provide documentation of landfill inspections. Additionally, water table and potentiometric surface maps for the March quarterly (Landfill M13) and April semi-annual sampling event are included.

1.1 FACILITY DESCRIPTION AND BACKGROUND

Joliet Army Ammunition Plant was a former United States Army (Army) munitions production facility located on approximately 36 square miles (23,542 acres) of land in Will

County, Illinois (Figure 1-1). The former facility is located approximately 60 miles southwest of Chicago and 14 miles south of Joliet, Illinois. As shown on the Groundwater Studies Area Map and Landfill Sites (Figure 1-2), the JOAAP property is divided into two main functional areas: the Manufacturing (MFG) Area, west of Route 53, and the Load-Assemble-Package (LAP) Area, east of Route 53. The facility has been described in detail in Section 1.1 of the *Final Long-term Monitoring Plan for Environmental Remediation Services* (LTM Plan [TolTest/MWH, 2010]).

The MFG Area, covering approximately 14 square miles (9,159 acres), is where the chemical constituents of munitions, propellants, and explosives were produced. The production facilities were generally located in the northern half of the MFG Area. In the southern half of the MFG Area, there was an extensive explosives storage facility. The LAP Area, covering approximately 22 square miles (14,383 acres), is where munitions were loaded, assembled, and packaged for shipping. The LAP Area contained munitions filling and assembly lines, storage areas, and a demilitarization area.

Joliet Army Ammunition Plant was constructed during World War II. The production output varied with the demand for munitions. Although the plant was used extensively during World War II, all production of explosives halted in 1945. At that time, sulfuric acid and ammonium nitrate plants were leased out, and the remaining production facilities were put in layaway status. The installation was reactivated during the Korean War, and again during the Vietnam War. Production gradually decreased until it was stopped completely in 1977.

Hazardous wastes were generated and released into the environment through several pathways. Process waters used in the production and handling of 2,4,6-trinitrotoluene (TNT) and other compounds were discharged into drainage systems. Buildings and equipment were periodically washed to remove explosive residues and the wastewater would be allowed to leach into the ground or flow into the local surface water and creeks. Later, process water incineration or industrial wastewater treatment produced ash or explosives residue that accumulated over time. Ash from the incineration of production by-products was stored in landfills on-site. Equipment and demolition materials were flashed (burned) to remove residues. Fire training areas, used to keep fire and safety personnel suitably prepared, introduced contaminants to the soil and groundwater. Leaks and spills occasionally occurred in the storage and handling of oils and other liquids. Wastes and unusable explosives and munitions were burned or detonated. In addition, munitions were tested, leaving some residuals in the soil at the test sites. Vehicle and equipment maintenance, transformer leaks, and the handling of pesticides introduced further contamination to the soil.

Wastes generated during production activities resulted in environmental contamination at various sites around JOAAP. Because of this contamination, the United States Environmental Protection Agency (USEPA) placed the MFG Area on the National Priority List (NPL) on July 21, 1987 and the LAP Area on the NPL on March 31, 1989.

The contaminated media identified at JOAAP were divided into two operable units (OUs) to aid in the development and evaluation of remedies. The SOU consists of sites where contaminated soils, sediments, and debris were identified. The GOU consists of sites where contaminated groundwater was identified. Surface water was determined to pose no risk to health and the environment and therefore is not addressed further as a contaminated media. However, surface water discharge is a major component of the shallow groundwater system, and localized detections of explosives may occur near contaminated groundwater sites. For this reason, surface water is relevant to the GOU.

Substantial land at JOAAP is not contaminated. Transfer activities for that land have occurred and some are still underway. After remaining potential hazards to human health and the environment are addressed under the SOU and these properties are found suitable for transfer under Public Law 104-106 and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), the Army will prepare documentation for transfer.

The Illinois Land Conservation Act of 1995, PL 104-106, Div. B, Title 2901-2932, February 10, 1996, states that the Army will transfer JOAAP land to various federal, local, and state jurisdictions. Transfer of land is occurring incrementally as it is remediated and is deemed appropriate. As of production of this report, the distribution of JOAAP land through these incremental transfers is approximately 17,726 acres to the United States Department of Agriculture (USDA) for establishing the Midewin National Tallgrass Prairie; 982 acres to the Department of Veterans Affairs to establish a Veterans Cemetery; 455 acres to Will County, Illinois to establish the Will County Landfill; and 2,885 acres to the State of Illinois to establish two industrial parks.

Where groundwater contamination is present within areas to be transferred, the Army has included institutional controls (ICs) in the transfer documents to prevent exposure to contaminants, limit groundwater pumping, and prevent manipulation of the natural groundwater flow patterns through any means. These controls will help to limit the spread of the remaining contamination in groundwater and will remain in effect with the land until removed by mutual agreement of the Army, USEPA, Illinois Environmental Protection Agency (IEPA), and the current landowner.

1.2 NATURAL ATTENUATION MECHANISMS

The selected remedial action for the GOU is remediation by natural attenuation. A detailed overview of the physical, chemical, and biological criteria, which are most directly linked to natural attenuation mechanisms and the site-specific criteria used to evaluate natural attenuation at JOAAP is provided in the LTM Plan and annual groundwater monitoring reports where natural attenuation is evaluated and reported.

1.3 RECORD OF DECISION REQUIREMENTS

The ROD specified general groundwater monitoring requirements. These requirements were based on information presented in the Remedial Investigation (RI) Report and did not have the additional information provided by the predesign investigation completed in 1998 or subsequent remedial actions completed at JOAAP. As such, the Army applied subsequent site data as well as historic data to arrive at site-specific LTM locations and analytes, which were included in the LTM Plan.

Based on the objectives presented in Section 1.2 of the LTM Plan and as an extension of the ROD, several types of monitoring are required for each site. These include:

- Collection of groundwater samples to evaluate contaminant concentrations;
- Collection of surface water samples where groundwater discharges to surface features to evaluate surface water contaminant concentrations;
- Collection of depth to water measurements to evaluate groundwater flow;
- Documentation and evaluation of source removal or surface disturbing activities;
- Documentation of changes in surface water features, impoundments, or conveyances; and
- Evaluation of evidence concerning illicit water withdrawal affecting contaminant migration.

1.4 LONG-TERM MONITORING PLAN

Monitoring activities are required pursuant to the decision documents developed for the various contaminated sites found at JOAAP. The LTM Plan was produced to present LTM activities for the GOU and required SOU maintenance activities. The LTM Plan includes activities associated with long-term maintenance of the remedies selected for JOAAP. The objective of the LTM Plan was to provide a sufficiently detailed description of the monitoring strategy and process and to establish realistic expectations for execution of the program on the part of all stakeholders. With respect to the latter objective, it is the intent of the plan to establish both the actions to be taken in the event of various sampling outcomes and the set of conditions required to reduce and eventually discontinue long-term monitoring efforts where practicable. As such, it includes sample collection and analysis of ground and surface water, surveillance of cap maintenance and access restrictions at landfills, and surveillance of land use restrictions and other ICs implemented on an installation-wide basis.

Section 3.1 of the LTM Plan summarizes the GMZs and monitoring well designations and discusses the decision tree for interpretation of groundwater quality results and the logic for

optimizing site monitoring programs. Section 3.2 of the LTM Plan discusses IC monitoring required as part of the MNA remedy.

The LTM program is presented in Section 4.0 of the LTM Plan which includes a discussion of site-specific monitoring programs for the GMZs and landfills, monitoring well installations, abandonments, monitoring schedules, requirements for IC monitoring, and reporting schedules. Tables A1-1 through A1-9 of Appendix A (Field Sampling Plan, [FSP]) of the LTM Plan provide specific information about the monitoring requirements at each site. However, it is expressly presented that the LTM program will likely change with changing conditions. Therefore, the LTM Plan tables were consolidated into a single table that is continually updated based on groundwater monitoring results and periodic reviews. The sampling completed for spring 2012 is presented as Table 1-1 in this report and summarizes the monitoring locations and requisite analyses for those sample locations.

The LTM Plan provides a site-specific evaluation of the natural attenuation remedial option that is being applied to all GOU sites. The purpose of the LTM Plan is to:

- describe the process by which data will be collected and analyzed,
- determine if remedies in place at JOAAP are protective of human health and the environment,
- describe the nature of monitoring results that, if observed, would indicate further action be taken because the remedy does not appear to be sufficiently protective,
- prescribe the conditions under which certain monitoring activities may be terminated,
 and
- provide a detailed description of activities to monitor the GOU natural attenuation RA.

Section 5 of the LTM Plan describes reporting requirements for LTM activities. The LTM Plan reporting schedule requires the submittal of a semi-annual report, which is a presentation of the results of the winter and spring sampling events with minimal analysis, and an annual report that presents the results of the summer and fall sampling event with detailed evaluation of trends in the groundwater data. The semi-annual sampling schedule identified in the LTM Plan indicates that the sampling periods will generally be January and October of each year at all sites except Landfill M13, which is sampled quarterly, generally in January, April, July, and October of each year. In 2012, the winter quarterly sampling event at Landfill M13 was conducted during February and the spring semi-annual sampling event was conducted in April. Annual groundwater monitoring reports are the venue in which data are analyzed and proposed changes to the LTM Plan are presented. Acceptance of the final annual groundwater monitoring report by regulators will constitute approval of recommended changes in the monitoring program.

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The LTM Plan also provides for a five-year review of the GOU natural attenuation remedy and SOU remedy, as required by the ROD. Natural attenuation data were collected during the Fall 2003 sampling event to facilitate the first five-year review. The First Five-Year Review Report was completed following the Fall 2003 sampling event. The Final Second Five-Year Review Reports for the GOU and SOU were submitted in August 2009. Subsequent five-year reviews will be completed to evaluate the effectiveness of the GOU and SOU remedies and, if necessary, provide recommendations to modify the remedy to make it more effective. The Third Five-Year Review Report will have the GOU and SOU remedy protectiveness evaluated in one consolidated document. Furthermore, if the third five-year review suggests that natural attenuation may not result in reasonable agreement with ROD requirements, evaluation of available contingency remedies will be presented as part of the five-year review process.

2.0 SITE ACTIVITIES

This section provides a summary of the LTM Plan requirements, the groundwater monitoring activities at each of the GOUs, and the SOU RA landfill inspections.

2.1 GROUNDWATER MONITORING

This section provides a summary of the field activities undertaken to perform winter and spring quarterly groundwater monitoring at Landfill M13, and spring semi-annual monitoring at remaining GOU and SOU sites. Site L2 was not sampled in Spring 2012 as recommended in the 2009 Annual Report. Site L14 was not sampled in Spring 2012 as recommended in the 2010 Semi-annual Report.

The measurement of water levels at the monitoring wells was conducted using an electronic water level indicator. Depth to water was measured from a datum mark on the top of the well casing at each monitoring well. All measurements were to an accuracy of ± 0.01 foot (ft).

In accordance with the standard operating procedure for low-flow sampling, monitoring wells were purged and sampled using low flow sampling techniques at a flow rate of approximately 100 to 250 milliliters per minute (ml/min). Dedicated ¼-inch (in.) outside diameter (OD) TeflonTM lined polyethylene tubing is installed in each monitoring well. The TeflonTM lined polyethylene tubing is connected with dedicated silicon tubing to a variable speed peristaltic pump. During purging, the pump discharge tube is attached to a multi-probe water quality meter equipped with a flow-through cell. The water quality meter is equipped with probes for measuring field parameters including temperature, pH, specific conductivity (SpC), oxidation/reduction potential (ORP), and dissolved oxygen (DO). The water quality meters were calibrated daily in accordance with Appendix A (FSP) of the LTM Plan and the manufacturer's instructions.

Measurements of field parameters were taken at 2-minute intervals and recorded on Groundwater/Surface Water Sampling Forms. Final field purge parameters are summarized in Table 2-1. Purging of each monitoring well was considered complete when field parameters stabilized over three successive measurements to within 10%. Upon stabilization of the field parameters, the required samples were collected from the discharge tube of the pump into laboratory-supplied containers after disconnecting the flow-thru cell.

Samples were collected in laboratory supplied preserved containers for explosive compounds in one-liter amber glass bottles; target analyte list (TAL) metals in one-liter, nitric acid preserved polyethylene bottles; inorganic parameters nitrate and sulfate in 250 milliliter unpreserved polyethylene bottles; volatile organic compounds (VOCs) in 40 milliliter, hydrochloric acid preserved glass vials; and semi-volatile organic compounds (SVOCs) in one-liter amber glass bottles. Samples were analyzed by Test America,

University Park, Illinois in accordance with Appendix B – Quality Assurance Project Plan (QAPP) of the LTM Plan. Samples collected for inorganic parameters TAL metals, nitrate, and sulfate were field filtered using high capacity 0.45 micron cartridge filters.

2.1.1 February 2012 Monitoring

TolTest/MWH measured water levels at eleven monitoring wells and sampled eight monitoring wells as summarized in Table 1-1. The first quarterly monitoring event in 2012 at Landfill M13 was conducted on 29 February and 01 March 2012.

The gauging of the monitoring well water levels was accomplished using techniques discussed in Section 2.1. Groundwater elevations are summarized in Table 2-2 for the MFG.

Groundwater monitoring was conducted in accordance with Appendix A (FSP) of the LTM Plan, as described above.

Blind duplicate samples were collected at a rate of 10% (1 per 10) for each analyte sample total. Blind duplicate M13-MW999 was collected at parent location M13-MW809 at Landfill M13 for VOCs, SVOCs, explosives, TAL metals, nitrate, and sulfate.

Matrix spike/matrix spike duplicate (MS/MSD) samples are collected at a rate of 5% (1 per 20) for each analyte sample total.

Third-party Level III data validation was completed for all groundwater and surface water samples collected. Based on the results of the validation, a data usability report was completed and is included in Appendix B1 and data validation reports are included in Appendix B2 of this report.

2.1.2 April 2012 Monitoring

TolTest/MWH measured water levels or surveyed a total of 142 monitoring wells and surface water locations at JOAAP. A total of 34 monitoring wells and 1 surface water location were sampled at the MFG (M1, M6, M7, M9, other areas, Landfill M11, and Landfill M13) and 10 monitoring wells and 5 surface water locations were sampled at the LAP Area (sites L1 and L3/Landfill L3) as summarized in Table 1-1. Field activities were conducted from April 10 through 17, 2012 in accordance with Appendix A (FSP) of the LTM Plan.

The gauging of the monitoring well water levels was accomplished using techniques discussed in Section 2.1. Surface water elevations are determined by referencing to the known elevations of nearby benchmarks using a level and rod and from marks on existing structures (bridges) for some locations; where at others a direct measurement with a water level indicator was completed. All gauging and surveying measurements were taken to an accuracy of +/- 0.01 ft. All surface water locations contained water during gauging and

sampling activities. Water level measurements and surveying activities for each site were generally completed within a 24-hour period.

Monitoring well information for the MFG area monitoring wells and water levels measured in February and April 2012 are summarized in Table 2-2. Monitoring well information for the LAP area monitoring wells and water levels at monitoring wells measured in April 2012 are summarized in Table 2-3. Surface water elevations are summarized in Table 2-4. Groundwater and surface water hydraulics are discussed in Section 3 on a site by site basis.

Groundwater sampling was conducted in accordance with Appendix A (FSP) of the LTM Plan, as described above. Surface water samples were collected by directly immersing the sample container into the surface water body so as to fill the bottle if filtration was not required. If filtration was required, a peristaltic pump with tubing placed directly in the surface water body was used for sample collection.

Blind duplicate samples are collected at a rate of 10% for each analyte sample total. The majority of the duplicate samples were collected from monitoring wells that had previous analyte detections. Duplicate samples were collected from eight monitoring wells in the LAP and MFG areas in April 2012. Details concerning field duplicates for April 2012 are as follows:

Duplicate Sample Number	Monitoring Point Sampled	Site	Sample Date	Analyte
MW994	MW652	M6	4/14/2012	Explosives
MW995	MW123R	M6	4/14/2012	Explosives
MW997	MW642	M1	4/12/2012	Sulfate
MW998	MW641	M1	4/12/2012	Sulfate
MW999	MW630	L3/Landfill L3	4/11/2012	Explosives and TAL Metals
MW999	MW362	M13	4/16/2012	VOCs, SVOCs, Explosives, TAL Metals, Nitrate, and Sulfate

Matrix spike/matrix spike duplicate samples are collected at a rate of 5% for each analyte sample total.

Third-party Level III data validation was completed for all groundwater and surface water samples collected. Based on the results of the validation, a data usability report was completed and is included in Appendix B1. Data validation reports are included in Appendix B2 of this report.

Repair activities completed during the April 2012 sampling activities included the following:

- A new lock was added to L1 monitoring well MW173
- A new lock was added to L3 monitoring well MW3
- A weep hole was drilled in the protective casing for M1 monitoring well MW104
- A new well cap was added to MFG monitoring well MW118

Additional required repair activities identified include the following:

- The hinge requires repair on L3 well MW411
- A new lock and weep hole are required at M9 monitoring well MW121

These required repair activities will be completed during the fall 2012 sampling round.

2.2 LANDFILL INSPECTIONS

Post-closure monitoring requirements for Landfills L3, L11, and M13 are mandated by Illinois Administrative Code (IAC) Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for 15 years at Landfill M13 and 30 years at Landfills L3 and M11. The LTM Plan states that the L3 Landfill cover will be inspected quarterly, the M11 Landfill cover will be inspected quarterly for the first five years and annually for 25 years, and the M13 Landfill cover will be inspected quarterly. Objectives include:

- Confirm that the landfill cap has controlled leaching so that water quality will not be threatened in the future;
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed;
- Keep survey points protected and visible to facilitate identification in the future.
- At M13 ensure the fence and signage installed to restrict site access remain in place and serviceable; and
- At M13 certify that institutional controls remain in place.

According to IAC and the Final LTM Plan, Landfill L3, M11, and M13 covers will be inspected on a quarterly basis for:

• Depressions indicating subsidence or other deformations that could breach the cover;

- Erosion features:
- Growth of deep rooted vegetation or invasive species that would adversely affect evapotranspiration and/or erosion armoring; and
- Debris or blockage of drainage structure.

In addition, land use restrictions have been imposed across the area within the fence. Annual certification is required to document that none of the following are occurring within the fence:

- Development
- Intrusive work
- Excavation that could mobilize contaminants of concern (COCs)
- Alteration of surface water flow
- Vehicle use other than that associated with maintenance of the cover/cap.

Landfill inspections were conducted on a quarterly basis at landfills L3, M11, and M13 starting in October 2008 in accordance with the LTM Plan. Landfill inspection reports for March and April 2012 are included as Appendices A1 and A2, respectively.

2.2.1 March 2012 Landfill Inspections

Site inspections of Landfills L3, M11, and M13 were conducted on March 1, 2012 in accordance with the LTM Plan. The rip rap along Prairie Creek at Site L3 has been washed away at several locations and is in need of repair. Although small areas of the synthetic cap is exposed at several locations as a result of the rip rap being washed away, the landfill appears to be stable and does not appear to be failing. The remaining rip rap also appears to be stable. The March Post-Closure Inspection Report is included in Appendix A1.

2.2.2 April 2012 Landfill Inspections

Site inspections of Landfills L3, M11, and M13 were conducted on April 18, 2012 in accordance with the LTM Plan. Woody vegetation growing on Landfills L3, M11, and M13 were removed prior to the inspection. The rip rap along Prairie Creek at Site L3 has been washed away at several locations and is in need of repair. Although small areas of the synthetic cap is exposed at several locations as a result of the rip rap being washed away, the landfill appears to be stable and does not appear to be failing. The remaining rip rap also appears to be stable. The April Post-Closure Inspection Report is included in Appendix A2.

2.3 INSTITUTIONAL CONTROLS MONITORING

The remedies selected for all areas of JOAAP do not allow unrestricted use of the property or underlying groundwater. Restrictions on use of groundwater are limited to the GMZs and annual certification that the restrictions are being maintained for each GMZ is required. Land use restrictions over and above those associated with groundwater use apply wherever waste or contamination has been left in place at levels that pose an unacceptable risk without some form of ICs. Some of those areas include the three landfills (L3, M11, and M13) with associated restrictions with annual certification. For all other areas with institutional controls there is a need for similar annual certification that the deed restrictions remain in place and are effective. Annual certifications are completed separate from this report. However, during groundwater monitoring and landfill inspections conducted quarterly at Landfill M13 and site-wide sampling conducted semi-annually in 2012, there were no observations of intrusive soil activities, construction, or improper use of groundwater which would affect the GOU or SOU remedies.

3.0 RESULTS AND RECOMMENDATIONS

Groundwater management zones are three-dimensional areas containing groundwater being managed to mitigate impairment according to IAC. The GMZs comprise both the glacial drift and shallow bedrock (Silurian Dolomite) aquifer and are bounded at depth by a confining shale unit (Maquoketa Shale). The GMZs were established with acceptance of the ROD. Any future modification of GMZ boundaries will have to be mutually agreed upon between the Army, USEPA, and IEPA. Groundwater monitoring wells and surface water collection points located inside and/or near the borders provide monitoring points for contaminant plumes. Site-specific plans for GMZs for GOU sites are discussed in Sections 3.1 through 3.6.

Groundwater and surface water samples collected in February and April 2012 were analyzed for one of more of the following parameters: explosive compounds, TAL metals, indicator parameters (nitrate and sulfate), VOCs, and SVOCs. Analytical results from spring 2012 sampling events for explosive compounds, TAL metals, indicator parameters (nitrate and sulfate), VOCs, and SVOCs are summarized in Tables 3-1 through 3-5, respectively. This section provides a site-specific presentation of the water level measurements and groundwater and surface water quality sampling results. The discussions are arranged by the GMZs into which each of the sites is grouped. This provides an ability to discuss the contaminant detections in relation to each of the GMZ boundaries.

Each site in Section 3 is organized into the following subsections:

<u>General Site Introduction:</u> General site-specific background information is presented along with any information on site monitoring wells and surface water sampling locations and water elevation measurements.

<u>Groundwater Hydraulics:</u> Site or GMZ figures are presented for the water table and potentiometric surface (generally in the bedrock). For groundwater hydraulic purposes, monitoring wells are designated as overburden wells (OVB), combined overburden/bedrock wells (COMBO), or bedrock wells (BRK). This designation indicates in which aquifer(s) the well is screened. When practical, discussions include the relationship between groundwater flow direction, hydraulic gradients, and contaminant migration.

<u>Analytical Results:</u> Figures are presented for contaminant detections observed during the February (Landfill M13) and April 2012 sampling rounds. For groundwater quality discussions, monitoring wells and surface water sampling points are designated as inplume, early warning, or compliance points and at Landfill sites as upgradient or downgradient. These designations are included in the LTM Plan and are based on the location of the sampling point relative to historic groundwater detections, site GMZ, and/or site features.

Analytical data from 2012 sampling are included in the discussion of analytical results. Contaminant concentrations that are greater than site RGs are included in the discussion even if there is not a notable change in the analytical data for that constituent.

Most Sample Quantitation Limits (SQLs) are less than site RGs; SQLs are provided for each compound in the Data Validation Report (DVR) presented in Appendix B2. In the discussion of analytical results, 'not detected' (ND) implies that the contaminant concentration is less than site RGs. Analytical data are reported to the SQL. If there were detections between the method detection limit (MDL) and the SQL, the quantity would be flagged "J" as estimated concentration (J). The MDLs are less than the RGs.

<u>Recommendations:</u> Recommendations for each site are presented specific to the conditions of the LTM Plan. A summary of recommendations is presented in Section 4. Since there is little evaluation of trends included in the semi-annual reports, the recommendations included herein are general in nature.

3.1 SITE L1

Site L1 is one of six GMZs created to manage risk arising from groundwater contamination and to monitor performance of the selected remedy. Site L1 comprises 80 acres on which munitions production facilities were constructed in 1941. It is centrally located in the northern portion of the LAP Area as can be seen on Figure 1-2. Historically, Site L1 was used for demilitarization and reclamation of various munitions starting with crystallization of ammonium nitrate, but then was converted for shell renovation and 1,3,5-trinitrobenzene (TNB) recovery up until 1945. By April of 1946, it had been reactivated to reclaim TNT.

In the TNT operation, hot water was used to wash the TNT out of shells. The water was discharged to a sump where solid explosives were removed for burning and the overflow (pink water) was routed to a 4.3-acre ridge and furrow evaporation/percolation pond. By 1952, two additional evaporation ponds had been constructed southeast of the ridge and furrow unit on either side of a drainage ditch flowing from it to Prairie Creek. Prairie Creek, the surface water body draining the area, is incised into the bedrock and appears to transmit groundwater that discharges directly or emerges into the streambed by virtue of the head relief available in the open channel.

Explosive residues in soil were observed in the ridge and furrow impoundment, the western most of the two newer ponds, the area south of the washout building, and the soil around the sump. The underlying groundwater contains TNT, TNB, 2,6-dinitrotoluene (2,6-DNT), and royal demolition explosive (RDX) both in the alluvium and in the shallow weathered bedrock, as well as degradation products from those parent compounds, as a result of the infiltration of pink water and possibly continued leaching of explosives in soil. The footprint of remedial goal (RG) exceedances currently extends to the southeast of the source area (in the proximity of MW131) to monitoring well MW173. Soil source control measures at the ridge and furrow pond were conducted in 2005 to 2006. The

contamination is now a legacy groundwater plume continuing to migrate to the southeast towards Prairie Creek, where it is believed to largely discharge into the creek through upwelling. Given these observations, the contaminant footprint is expected to separate from the source area over time and migrate in the alluvium and shallow bedrock until it discharges to Prairie Creek.

The overburden aquifer generally consists of a complex stratification of clay and silt, with some silty gravel observed in the eastern portion of the site near MW174. Overburden generally thins from approximately 20 ft in the north to less than 5 ft in the south and from approximately 15 ft in the east to 5 ft in the west.

3.1.1 Groundwater Hydraulics

The groundwater monitoring network at Site L1 consists of 16 wells: 8 overburden wells, 1 combined overburden/bedrock well, and 7 bedrock wells. Water levels are measured at the groundwater/surface water locations that are sampled (listed below), and at monitoring wells MW171, MW175, MW176, MW177, MW178, MW400, MW610, MW611 and WES2. Monitoring well information and water levels for April are summarized in Table 2-3. The groundwater flow direction in the overburden aquifer is generally toward the southeast as shown on Figure 3-1.

The horizontal gradient in the northern part of Site L1 was calculated to be 0.0118 feet per foot (ft/ft) and in the southern part of Site L1 was calculated to be 0.0126 ft/ft in April (Table 3-6). Using the reported average of 9.2E-06 centimeters per second (cm/sec) for hydraulic conductivity and an assumed porosity of 0.30, the calculated flow velocity in the overburden at Site L1 was approximately 0.0011 feet per day (ft/day) or 0.402 feet per year (ft/yr) in April (Table 3-7). As stated in the LTM Plan, a value of 16 ft/yr will be used to evaluate data from groundwater early warning sample points, which will accommodate heterogeneities present in the overburden aquifer.

Bedrock wells are installed at shallow depths (<10 ft below top of bedrock). The groundwater flow direction in the bedrock aquifer is generally toward the southeast as shown on Figure 3-2. Prairie Creek, the surface water body draining the area, is incised into the bedrock in the southern and central parts of the site and appears to transmit groundwater that discharges directly or upwells into the streambed by virtue of the head relief available in the open channel. There is no evidence that contamination flows beneath Prairie Creek as it has not appeared in monitoring wells to the west. The groundwater elevation at monitoring well MW611 was greater than the elevation of Prairie Creek, indicating a gaining stream scenario. Vertical gradients observed were upward at well nests MW171/MW177, MW172/MW173, and MW401/MW610 and downward at well nest MW178/MW176 in April (Table 3-8).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically. Based on groundwater flow data, Prairie Creek is the likely discharge point for shallow groundwater in the vicinity of Site L1.

3.1.2 Analytical Results

Groundwater and surface water sampling points for Site L1 during spring 2012 are summarized in Table 1-1. The following monitoring wells and the surface water sampling location at L1 are sampled for explosives:

- In-Plume MW131, MW173, and WES1
- Early Warning MW174 and WES3
- Compliance –surface water sampling point SW550 for the overburden aquifer

Groundwater and surface water samples collected at Site L1 in April 2012 were analyzed for explosive compounds in accordance with Appendix B (QAPP) of the LTM Plan. Explosive compound detections for April 2012 sampling conducted at Site L1 are summarized in Table 3-1 and on Figure 3-3. A brief discussion of analytical results by well type follows.

In-Plume Wells (MW131, MW173, and WES1): At overburden monitoring well MW131, 1,3,5-TNT exceeded the RG at a concentration of 2,200 micrograms per liter (μ g/L) for the April sampling event.

At overburden monitoring well MW173, RDX exceeded the RG at a concentration of $10\,\mu\text{g/L}$ and TNT exceeded the RG at a concentration of $12\,\mu\text{g/L}$ for the April sampling event.

At bedrock monitoring well WES1, TNB exceeded the RG at a concentration of 40 μ g/L and TNT exceeded the RG at a concentration of 38 μ g/L for the April sampling event.

The continued detection of degradation products 2-amino-4,6-dinnitrotoluene (2-A-4,6-DNT) and 4-amino-2,6-dinnitrotoluene (4-A-2,6-DNT) in samples collected from in-plume monitoring wells indicate contaminant reduction is occurring.

Early Warning Wells (MW174 and WES3): At overburden monitoring well MW174 and bedrock well WES3, there were no RG exceedances of explosive compounds for the April sampling event.

Compliance Point (SW550): At surface water sampling point SW550, there were no detections of explosive compounds for the April sampling event.

3.1.3 Recommendations

There are no changes in the monitoring program or network recommended. Sampling at Site L1 should be performed during the Fall 2012 sampling event as outlined in Table 3-9.

3.2 SITE L3/LANDFILL L3

Site L3 is the third of six GMZs created to manage risk arising from groundwater contamination and to monitor performance of the selected remedy. Site L3 comprises approximately 50 acres used as a demolition area directly southwest of Site L2 (Figure 1-2). Landfill L3 (described below) occupies 3.32 acres of the Site L3 area (Figure 3-4). Site L3 is bounded on the west by Prairie Creek, the south by an unnamed tributary of Prairie Creek, and the east by Star Grove Cemetery. Predominant use of the area was for open burning of combustibles and munitions crates, including some materials with low level explosive contamination. An air curtain destructor was constructed at the site to reduce emissions, but was never put into use. There was also a one-acre fire training area at the site, a small depression surrounded by an earthen berm.

Specific burning units included "U" and "L" shaped burn pads and a burn cage on a concrete slab. Geophysical surveys noted a number of metallic anomalies buried around the burn pads. The soil was also found to contain lead and RDX contamination at levels requiring remediation. Berms along Prairie Creek were found to contain lead, chlordane, 2,6-DNT, and phosphate above their respective RGs. It has been posited that the contamination in these berms arises from filling activity in the area when the berms were constructed. Unexploded ordnance may also be present in this area. The remedy selected for the area along Prairie Creek was consolidation and capping into what is now called Landfill L3.

Landfill L3 is located along the western edge of the Site L3 GMZ on the east bank of Prairie Creek, as illustrated on Figure 3-4. The area of Landfill L3 was originally contaminated through import of contaminated fill. However, other waste and contaminated soil have been moved to the Site L3 Landfill as a part of the L3 RA in order to consolidate residual contamination into a smaller footprint. Implementation of the remedy began in 2007 and was completed in 2008.

Landfill L3 is believed to contain metals and explosive residues that could continue to contaminate the underlying groundwater and migrate to Prairie Creek. Because the landfill is bordered by Prairie Creek, any contamination that infiltrates from the filled area would be expected to migrate to Prairie Creek and quickly be discharged as the groundwater flows upward into the surface water body.

Monitoring at Landfill L3 is mandated by IAC Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for a period of 30 years. Objectives include:

- Confirm that the landfill cap has controlled leaching so that water quality will not be threatened in the future;
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed; and

• Keep survey points protected and visible to facilitate identification in the future.

Samples from overburden well MW410 are obtained from a silt layer. Samples from combination well MW630 and bedrock well MW412 are obtained at shallow depths (<10 ft below top of bedrock), while samples from bedrock wells MW631 and MW633 are obtained from intermediate depths (10 to 20 ft below top of bedrock).

3.2.1 Groundwater Hydraulics

The groundwater monitoring network at Site L3/Landfill L3 consists of 11 wells: 4 overburden wells, 2 combined overburden/bedrock wells, and 5 bedrock wells. Water levels are measured at the groundwater/surface water locations that are sampled (listed below), and at monitoring wells MW136, MW137, and MW411. Additionally, the water leve4l was measured in April at Site L2 (which was not sampled in April) monitoring well MW134 to provide horizontal groundwater level control. Monitoring well information and water levels for April are summarized in Table 2-3. Surface water elevation in the northern portion of the site is dictated by the dam located on Prairie Creek just north of Central Road (Figure 3-4). The groundwater flow direction in the overburden aquifer is generally toward the west/southwest as shown on Figure 3-4.

The horizontal gradient in the overburden aquifer at Site L3 was calculated to be 0.0276 ft/ft in April (Table 3-6). Using an average hydraulic conductivity value of 1.6E-03 cm/sec and an assumed porosity of 0.3, the flow velocity in the overburden aquifer at Site L3 was approximately 0.4172 ft/day or 152 ft/yr in April (Table 3-7). There are no wells directly downgradient of MW410 or MW412 from which apparent travel times could be estimated. RDX has been observed in Prairie Creek, indicating it has migrated the intervening distance over the last 50 to 60 years but, because the contamination appears to arise from fill activity in the area, the presence of RDX in Prairie Creek water may represent contamination that started much closer to the stream bank than either of the inplume monitoring wells. Empirical data at Sites L1 and L2 have suggested transport rates more on the order of 2.5 to 11 ft/yr, but hydraulic conductivity may be higher in the disturbed soil of Site L3 and higher gradients found proximate to the discharge line along Prairie Creek. Accordingly, the larger of the two velocities, 11 ft/yr, is assumed for Site L3.

The groundwater flow direction in the bedrock aquifer is generally toward the west as shown on Figure 3-5. Prairie Creek, the surface water body draining the area, is incised into the bedrock in the southern and central parts of the site and appears to transmit groundwater that discharges directly or upwells into the streambed by virtue of the head relief available in the open channel. There is no evidence that contamination flows beneath Prairie Creek as it has not appeared in monitoring wells to the west. The groundwater elevation at monitoring well MW632 was greater than the elevation of Prairie Creek, indicating a gaining stream scenario. An upward vertical gradient was observed at well nest MW630/MW631 at Site L3 in April (Table 3-8), further supporting a gaining stream scenario.

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically. Based on groundwater flow data, Prairie Creek is the likely discharge point for all shallow groundwater in the vicinity of Site L3/Landfill L3.

3.2.2 Analytical Results

Groundwater and surface water sampling points for Site L3/Landfill L3 during April 2012 are summarized in Table 1-1. The following monitoring wells and surface water sampling points at L3 are sampled for explosives and TAL metals:

- Upgradient surface water sampling point SW004, where the creek first touches the GMZ boundary and upstream of the storm water outfall
- In-Plume/Downgradient MW410 and MW412
- Early Warning/Downgradient MW630, MW631, and MW633
- Compliance/Downgradient surface water sampling point SW777 for the overburden aquifer, where the creek leaves the GMZ boundary
- Downgradient Surface water sampling points SW557, upstream of the landfill drainage swale discharge, and SW558, at the constructed drainage swale along the southwest side of the landfill

Groundwater and surface water samples collected at Site L3/Landfill L3 in April were analyzed for explosive compounds and TAL metals in accordance with Appendix B (QAPP) of the LTM Plan. Explosive compounds detected during April 2012 sampling conducted at Site L3 are summarized in Table 3-1 and illustrated on Figure 3-6. Metals detected during April sampling conducted at L3/Landfill L3 are summarized in Table 3-2. For Landfill L3, the monitoring well locations are classified as upgradient or downgradient locations. Therefore, the same well can represent two separate classifications at Site L3/Landfill L3. A brief discussion of analytical results by well type follows:

Upgradient Point (SW004): At surface water sampling point SW004, there were no detections of explosive compounds or metals RG exceedances for the April sampling event.

In-Plume Wells (MW410 and MW412 {downgradient}): At overburden monitoring well MW410, there were no explosive compound detections or metals RG exceedances for the April sampling event.

At bedrock monitoring well MW412, RDX continued to exceed the RG at a concentration of $120~\mu g/L$ for the April sampling event. There were no metals RG exceedances for the April sampling event. The continued detection of degradation products 2-A-4,6-DNT and 4-A-2,6-DNT in samples collected from monitoring well MW412 indicate contaminant reduction is occurring.

Early Warning (downgradient) Wells (MW630, MW631, and MW633): At bedrock monitoring well MW630, there was a RG exceedance for RDX at a concentration of 8.7 ug/L for the April sampling event. There were no metals RG exceedances for the April sampling event.

At bedrock monitoring well MW631, there were no explosive compound detections or metals RG exceedances for the April sampling event.

At bedrock monitoring well MW633, RDX continued to exceed the RG at a concentration of 6.7 μ g/L for the April sampling event. There were no metals RG exceedances for the April sampling event.

Compliance (downgradient) Points (SW777): At surface water sampling point SW777, RDX was detected below the RG at a concentration of 0.25 ug/L for the April sampling event. There were no metals RG exceedances for the April sampling event.

Additional Downgradient Points (SW557 and SW558): At surface water sampling point SW557, HMX and RDX were detected below the RG at concentrations of 1.1 ug/L and 3.2 ug/L for the April sampling event, respectively. There were no metals RG exceedances for the April sampling event.

At surface water sampling point SW558, there were no explosive compound detections or metals RG exceedances for the April sampling event.

3.2.3 Recommendations

There are no changes in the monitoring program or network recommended. Sampling at Site L3/Landfill L3 should be performed during the Fall 2012 sampling event as outlined in Table 3-9.

3.3 SITE M1

Site M1, the southern ash pile, is part of the MFG facility (Figure 1-2), but contains unique contaminants not present at actionable levels at any other GMZ. As such, it is singled out as the fifth of the six GMZs. Site M1 comprises 68 acres in the southwestern part of the MFG facility, where from 1965 to 1974, ash residues from the incineration of "red water" (TNT production waste water) were landfilled and placed on unlined soil. At various times (1985, 1993, and 1996) after closure, polyvinyl chloride (PVC) and clay were used to repair erosion damage to the cover.

Groundwater beneath and downgradient of the pile was observed to contain elevated levels of sulfate, 2,6-DNT, and antimony. The latter two compounds exceeded their respective RG on a single sample event only, but the sulfate has exceeded its RG continuously in groundwater and occasionally in surface water. In February 2003, the United States Army

Corps of Engineers (USACE) submitted Explanation of Significance Difference Site M1 – Southern Ash Pile (USACE, 2003), which expanded the northern boundary of the GMZ for Site M1 to encompass concentrations of sulfate in excess of the RG that had migrated beyond the original boundary.

The elevated sulfate is believed to originate in leachate from the Site M1 ash pile that infiltrated through the soil and entered the shallow groundwater. Dissolved sulfate then migrated to the northwest. Sulfate-containing groundwater flows into Prairie Creek, which is located northwest of the former ash pile. Concentrations of sulfate have been measured as high as 46,000 milligrams per liter (mg/L), or over 100 times the RG of 400 mg/L. As recently as 2000, surface water samples were collected that exceeded the RG of 500 mg/L. The ash piles were removed in 2006-2007 eliminating the primary source of sulfate. Consequently, dissolved sulfate in groundwater is now a legacy plume migrating to the northwest.

The overburden aquifer primarily consists of silt and clay, with scarce amounts of sand and silty gravel at the bedrock contact. Sand is abundant in the higher, unsaturated, parts of the site. Over most of Site M1, the overburden thickness is fairly consistent between 15 and 20 ft thick. At the northern end of the site, near MW642/MW641, the overburden consists entirely of silty gravel and the depth to bedrock is greater than 40 ft. The presence of Prairie Creek in the western part of M1 suggests that Prairie Creek is the discharge point for shallow groundwater.

3.3.1 Groundwater Hydraulics

The groundwater monitoring network within this site consists of 18 wells: 10 overburden wells, 4 combined overburden/bedrock wells, and 4 bedrock wells. Water levels are measured at the groundwater/surface water locations that are sampled (listed below), and at monitoring wells MW104, MW105, MW106, MW201, MW347, MW351, and MW647. Monitoring well information and water levels for October are summarized in Table 2-2. The groundwater flow direction in the overburden aquifer is generally to the northwest, as shown on Figure 3-7.

The horizontal gradient at Site M1 was 0.0303 ft/ft in April (Table 3-6). Using an average hydraulic conductivity value of 6.6E-05 cm/sec and an assumed porosity of 0.3, the flow velocity in the overburden aquifer at Site M1 was approximately 0.0189 ft/day or 6.9 ft/yr in April (Table 3-7). However, that would indicate that the plume should be on the order of 80 ft from the ash pile after 40 years of travel time (1965 to 2005). In fact, by 2005, the elevated sulfate levels were observed out to MW645, a distance of 2,060 ft, which suggests a flow velocity of approximately 50 ft/yr.

The groundwater flow direction in the bedrock aquifer is generally toward the northwest, as shown on Figure 3-8. An upward vertical gradient was observed at well nest MW351/MW640 and a downward vertical gradient was observed at well nest MW641/MW642 in April (Table 3-8).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically. Based on groundwater flow data, Prairie Creek is the likely discharge point for all shallow groundwater in the vicinity of Site M1.

3.3.2 Analytical Results

Groundwater sampling points for Site M1 during spring 2012 are summarized in Table 1-1. The following monitoring wells and the surface water sampling point at M1 are sampled for sulfate:

- In-Plume MW107, MW231, MW640, MW641, and MW642
- Early Warning MW643 and MW644
- Compliance MW646 for the bedrock aquifer and MW645, MW648, and MW649 and surface water sampling point SW709 where the creek leaves the GMZ boundary for the overburden aquifer

Groundwater and surface water samples collected at Site M1 in April were analyzed for sulfate in accordance with Appendix B (QAPP) of the LTM Plan. Sulfate detections for the April sampling event conducted at Site M1 are summarized in Table 3-3 and shown on Figure 3-9. A brief discussion of analytical results by well type follows:

In-Plume Wells (MW107, MW231, MW640, MW641, and MW642): At monitoring well MW107, sulfate exceeded the RG at a concentration of 26,000 mg/L for the April sampling event.

At monitoring well MW231, sulfate exceeded the RG at a concentration of 35,000 mg/L for the April sampling event.

At monitoring well MW640, sulfate exceeded the RG at a concentration of 5,200 mg/L for the April sampling event.

At monitoring well MW641, sulfate exceeded the RG at a concentration of 640 mg/L for the April sampling event.

At monitoring well MW642, sulfate exceeded the RG at a concentration of 420 mg/L for the April sampling event.

Early Warning Wells (MW643 and MW644): At monitoring wells MW643 and MW644, sulfate was detected at concentrations below the RG for the April sampling event.

Compliance Points (MW645, MW646, MW648, MW649, and SW709): At monitoring wells MW645, MW646, MW648, and MW649 and surface water sampling point SW709, sulfate was detected at concentrations below the RG for the April sampling event.

3.3.3 Recommendations

There are no changes in the monitoring program or network recommended. Sampling at Site M1 should be performed during the Fall 2012 sampling event as outlined in Table 3-9.

3.4 MFG GMZ

The MFG Area is the sixth GMZ, lies in the northwestern part of JOAAP, and was created by the consolidation of several discrete sites including M3, M4, M5, M6, M7, M8, M9, M13, and outlying wells deemed as "Other Areas". The MFG Area GMZ is illustrated on Figure 1-2. Each of these areas hosted unique operations that led to the release of different contaminants. Groundwater contamination consisting of explosive compounds, excluding contamination from Landfill M13, is being managed collectively and is included as Section 3.6. Of the areas, only Sites M6, M9, and M13 continue to have groundwater contamination with COCs in excess of RGs. Each site comprising the MFG GMZ will be independently closed before the MFG GMZ can be eliminated.

Monitoring wells from Sites M6, M7, M9, and Other Areas continue to be included in the MFG groundwater sampling. Numerous monitoring wells are also measured as water level control points at these other sites.

3.4.1 Site M6

Site M6, the TNT Ditch Complex, covers 271 acres to the northwest of Site M5 in the central part of the MFG Area (Figure 1-2) and was largely used for TNT and DNT production during World War II, and then again in the Korean and Vietnam Wars. In between the wars, the facilities were used for research and development of different explosives like nitroxylenes. Production of TNT was terminated in 1977.

Production of TNT was conducted in 12 parallel lines, each containing a full sequence of production steps from the "mono-house" to the "bi-house" and then the "tri-house" buildings. Waste water ("red water") from each "tri-house" and the wash houses was discharged from wooden tanks to clay-lined ditches feeding into the TNT Ditch. In 1965, the original drainage system was replaced by wooden flumes completed in the TNT Ditch and the red water was diverted to Site M7 for treatment. Dintrotoluene production waste water was discharged from wooden tanks into open troughs and ditches that flowed to the storm water sewer system and the TNT Ditch, ultimately flowing untreated into Grant Creek. In addition to normal processing water, the TNT Ditch received drench water used to kill a production run when reactions ran out of control and posed an explosive threat. Between 1972 and 1974, there were more than 30 recorded instances of drenching with the associated discharge of "bi-oil" and concentrated nitric and sulfuric acid.

The full range of nitroaromatic compounds have been found in soil at Site M7, with concentrations of TNT, 2,4-dinitrotoluene (2,4-DNT), lead, arsenic, and beryllium

exceeding their respective RGs. Seven explosive compounds have been observed in the underlying groundwater at concentrations that exceed their respective RGs: TNT, 2,4-DNT, 2,6-DNT, 2-nitrotoluene (2-NT), TNB, nitrobenzene (NB), and RDX.

The overburden aquifer primarily consists of silt and clay, with variable amounts of sand and silty gravel. The overburden thickness ranges from 5 to 30 ft across the site. Based on available information, screens for overburden wells at Site M6 are set in silt and/or clay layers with the exception of monitoring wells MW650 and MW652; which have screens set in a silty gravel layer.

3.4.1.1 Groundwater Hydraulics

The groundwater monitoring network within Site M6 consists of 39 wells: 14 overburden wells, 2 combined overburden/bedrock wells, and 23 bedrock wells. Water levels are measured at the groundwater locations that are sampled (listed below), and at numerous monitoring wells at M6 and sites including M3, M4, M5, M8, M9, and "Other Areas". Monitoring well information and water levels for October are summarized in Table 2-2. The groundwater flow direction in the overburden aquifer is generally toward the west as shown on Figure 3-10.

The horizontal gradient in the northern part of Site M6 was calculated to be 0.0187 ft/ft and in the southern part of Site M6 was calculated to be 0.0225 ft/ft in April (Table 3-6). Using an average hydraulic conductivity value of 8.6E-04 cm/sec and an assumed porosity of 0.30, the flow velocity at Site M6 was approximately 0.1674 ft/day or 61.1 ft/yr in April (Table 3-7). However, at Site M6, COCs have not been detected at wells 600 ft directly downgradient (MW212R to MW123R and MW162R). Given the 60 years that have passed since releases began at Site M6, this suggests the transport time for RDX and TNT is less than 600/60 = 10 ft/yr. A rate of 10 ft/yr is comparable to transport rates calculated for other areas of JOAAP.

The groundwater flow direction in the bedrock aquifer is generally toward the west as shown on Figure 3-11. Screens for bedrock monitoring wells MW123, MW314, MW316, MW318, and MW654 are set at shallow depths (<10 ft below top of bedrock), while screens for monitoring wells MW118, MW119, MW213R, MW215R, MW310R, MW311, MW313, and MW653 are set at intermediate depths within the bedrock aquifer (10 to 20 ft below top of bedrock). Screens for monitoring wells MW312, MW315, MW317, MW320, MW651, and MW655 are set deeper within the bedrock aquifer (>20 ft below top of bedrock). Vertical gradients were generally downward for well nests located along the escarpment, where the former TNT load lines were oriented at Site M6, and were upward in the wetland immediately to the west in April (Table 3-8).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically.

3.4.1.2 Analytical Results

Groundwater sampling points for Site M6 during April 2012 are summarized in Table 1-1. The following monitoring wells at M6 and other sites included in the M6 grouping are sampled for explosives:

- In-Plume MW212R, MW652, and MW330 (M9)
- Early Warning MW123R, MW162R, MW313, MW318, MW319, and MW654
- Compliance MW117 and MW118 and MW119 (Other Areas).

Groundwater samples collected at Site M6 in April were analyzed for explosive compounds in accordance with Appendix B (QAPP) of the LTM Plan. Monitoring well MW330 was sampled for sulfate. Explosive compound detections for the April sampling event conducted at Site M6 are summarized in Table 3-1 and shown on Figure 3-12. Sulfate detections the April sampling event conducted at Site M6 are summarized in Table 3-3. A brief discussion of analytical results by well type follows:

In-Plume Wells (MW212R, MW652, and MW330): At monitoring well MW212R, 2,4-DNT (620 μ g/L), 2,6-DNT (260 μ g/L), and TNT (39 μ g/L) exceeded the RG for the April sampling event.

At monitoring well MW652, 2,4-DNT (8,400 μ g/L), 2,6-DNT (3,300 μ g/L), 2-NT (44,000 μ g/L), and TNT (1,600 μ g/L) exceeded the RG for the April sampling event.

At monitoring well MW330, sulfate exceeded the RG at a concentration of 430 $\mu g/L$ for the April sampling event.

Early Warning Wells (MW123R, MW162R, MW313, MW318, MW319, and MW654): At monitoring wells MW123R, MW162R, and MW313, there were no RG exceedances of explosive compounds for the April sampling event.

At monitoring well MW318, 2,6-DNT exceeded the RG at a concentration of 0.45 ug/L for the April sampling event.

At monitoring well MW319, there were no RG exceedances of explosive compounds for the April sampling event.

At monitoring well MW654, 2,4-DNT exceeded the RG at a concentration of 1.7 ug/L and 2,6-DNT exceeded the RG at a concentration of 0.97 ug/L for the April sampling event. The continued detection of degradation products 2-A-4,6-DNT and 4-A-2,6-DNT in samples collected from monitoring well MW654 indicate contaminant reduction is occurring.

Compliance Wells (MW117 and MW118 and MW119: At monitoring wells MW117, MW118, and MW119, there were no detections of explosive compounds for the April sampling event.

3.4.1.3 Recommendations

There are no changes in the monitoring program or network recommended. Sampling at Site M6 should be performed during the Fall 2012 sampling event as outlined in Table 3-9.

3.4.2 Site M7

Site M7, the Red Water Area, comprises 49 acres in the central part of the MFG Area between Site M6 and Site M7 on the west bank of the TNT Ditch (Figure 1-2). Facilities at Site M7 included storage tanks, pump stations, evaporators, and incinerators used to destroy the red water from Site M6 after construction in 1965. Overflows of untreated red water were stored in the Red Water Lagoon, a 3.3 acre impoundment that was remediated in 1985.

Contaminants of concern in soil included TNT, 2,4- and 2,6-DNT, TNB, and RDX. Source areas in soil included the drainage areas in the northwest part of Site M7. Soil RA activities were completed in 2001 at Site M7. Contaminants of concern in groundwater include: TNT, 2,4-DNT, 2,6-DNT, and RDX.

The overburden aquifer primarily consists of silt and clay, with some sand and gravel in the upper, unsaturated, part of the aquifer. The overburden thickness ranges from less than 5 to more than 10 ft across Site M7. Based on available information, samples from overburden wells are obtained from discontinuous sand and gravel layers.

3.4.2.1 Groundwater Hydraulics

The groundwater monitoring network at Site M7 consists of 9 wells: 4 overburden wells, 1 combined overburden/bedrock well, and 4 bedrock wells. Water levels are measured at each groundwater location that is sampled (listed below), and at monitoring wells MW156, MW159, MW216, MW217, MW321, MW322, MW660, and MW661. Monitoring well information and water levels for October are summarized in Table 2-2. The groundwater flow direction in the overburden aquifer in the immediate vicinity of Site M7 is generally toward the west/southwest as shown on Figure 3-10.

The horizontal gradient at Site M7 was calculated to be 0.0105 ft/ft in April (Table 3-6). Using an average hydraulic conductivity value of 6.7E-04 cm/sec and an assumed porosity of 0.30, the flow velocity at Site M7 was approximately 0.0665 ft/day or 24 ft/yr in April (Table 3-7).

The groundwater flow direction in the bedrock aquifer in the immediate vicinity of Site M7 is generally toward the west/northwest as shown on Figure 3-11. With the exception of well MW124R, bedrock wells are screened at intermediate depths within the bedrock aquifer (10 to 20 ft below top of bedrock). Bedrock well MW124R and combination well MW157 are screened at a shallow depth within bedrock (<10 ft below top of bedrock). Vertical gradients were calculated for well nests MW216/MW217, MW660/MW661, MW321/MW322, and MW157/MW158 located in the vicinity of Site M7. Calculated vertical gradients were downward at well nests MW321/MW322 and MW660/MW661, upward at well nest MW216/MW217 (located slightly north), and a very low vertical gradient was observed at well nest MW157/MW158 (located in the wetland west of the escarpment) (Table 3-8).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically.

3.4.2.2 Analytical Results

Monitoring well MW124R was sampled during April as an early warning bedrock well as part of the MFG monitoring network (Table 1-1).

The groundwater samples collected at Site M7 in 2012 were analyzed for explosive compounds in accordance with Appendix B (QAPP) of the LTM Plan. Explosive compound detections for the April sampling event conducted at Site M7 are summarized in Table 3-1 and shown on Figure 3-12. A brief discussion of analytical results by well type follows.

Early Warning Well (MW124R): At well MW124R, there were no detections of explosive compounds for the April sampling event.

3.4.2.3 Recommendations

There are no changes in the monitoring program or network recommended. Sampling at Site M7 should be performed during the Fall 2012 sampling event as outlined in Table 3-9.

3.5 LANDFILL M11

Landfill M11 is located in the southwestern part of the manufacturing side of JOAAP as illustrated on Figures 1-2. The landfill monitoring area comprises approximately 133 acres. Site M11 was divided into two sections by School House Road and bordered on the west by West Patrol Road. M11 north encompassed approximately 10.5 acres of former gravel pits that were mined and filled with waste. M11 south, a former gravel pit, encompassed approximately 5.6 acres that was also mined and filled with waste. The remedy chosen for M11 was waste consolidation and capping. Implementation of the remedy began in 2006 and was completed in 2008.

The current conceptual site model (CSM) is that M11 is believed to contain manganese and sulfate containing waste that could potentially contaminate underlying groundwater and migrate beyond the GMZ.

With the implementation of the RA at Site M11, it is anticipated that the landfill cap will prevent percolation of precipitation through waste consolidated in the landfill, thus preventing groundwater contamination.

Monitoring at Landfill M11 is mandated by IAC Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for a period of 30 years. Long-term monitoring of the landfill cap will include quarterly inspections of the cap, vegetation, and drainage structures for the first five years, then annually for 25 years. Objectives include:

- Confirm that the cap has controlled leaching at the landfill so that water quality will not be threatened in the future;
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed;
- Keep survey points protected and visible to facilitate identification in the future;

3.5.1 Groundwater Hydraulics

The groundwater monitoring well network at Landfill M11 consists of 13 wells: 3 combination overburden/bedrock wells and 10 bedrock wells. Water levels are measured at the groundwater locations that are sampled (listed below), and at monitoring wells MW108, MW337, MW338, MW339, and MW340. Monitoring well information and water levels for April are summarized in Table 2-2. The groundwater flow direction in the overburden aquifer is generally toward the west as shown on Figure 3-13.

The horizontal gradient at Landfill M11 was 0.0052 ft/ft in April (Table 3-6). Using a hydraulic conductivity of 6.7E-04 cm/sec from nearby Site M7 and an assumed porosity of 0.30, the calculated flow velocity at Landfill M11 was approximately 0.0329 ft/day or 12 ft/yr in April (Table 3-7).

Bedrock is shallow at Landfill M11, ranging from 2.5 to 9 ft below ground surface. The groundwater flow direction in the bedrock aquifer is generally toward the northwest as shown on Figure 3-14. The calculated vertical gradients were upward at upgradient well nest MW802/MW803 and downward at downgradient well nest MW804/MW805 in April (Table 3-8).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically.

3.5.2 Analytical Results

Groundwater sampling points for Landfill M11 during spring 2012 are summarized in Table 1-1. The following monitoring wells at Landfill M11 are sampled for VOCs, SVOCs, TAL metals, explosives, nitrate, and sulfate:

- Upgradient MW802
- Downgradient MW335, MW336, and MW805

Groundwater samples collected at Landfill M11 in April and were analyzed for explosive compounds, TAL metals, indicator parameters (sulfate and nitrate), VOCs, and SVOCs in accordance with Appendix B (QAPP) of the LTM Plan. Detections for explosive compounds, TAL metals, indicator parameters (sulfate and nitrate), VOCs, and SVOCs for the sampling events conducted at Site M11 in April are summarized in Tables 3-1, 3-2, 3-3, 3-4, and 3-5, respectively. Explosive compound detections are shown on Figure 3-15. Site M11 monitoring well locations are classified as upgradient or downgradient locations. A brief discussion of analytical results by well type follows:

Upgradient (MW802): There were no detections for explosive compounds for the April sampling event.

There were no RG exceedances for metals for the April sampling event.

There were no RG exceedances for nitrate or sulfate for the April sampling event.

There were no detections of VOCs for the April sampling event.

There were no detections of SVOCs for the April sampling event.

Downgradient (MW335, MW336, and MW805): There were no RG exceedances for explosive compounds for the April sampling event.

There were no RG exceedances for metals for the April sampling event.

There were no RG exceedances for nitrate for the April sampling event. There were RG exceedances for sulfate in the samples collected from monitoring wells MW335 (660 mg/L), MW336 (410 mg/L), and MW805 (470 mg/L) for the April sampling event.

There were no detections of VOCs for the April sampling event.

There were no detections of SVOCs for the April sampling event.

3.5.3 Recommendations

There are no changes in the monitoring program or network recommended. Sampling at Landfill M11 should be performed during the Fall 2012 sampling event as outlined in Table 3-9.

3.6 LANDFILL M13

Landfill M13 comprises approximately 106 acres of the central part of the MFG Area known as the gravel pits. It lies north of the Tetryl Production Area, east of the TNT Ditch Complex, and west of the Acid Area (Figure 1-2).

Landfill M13 is located in the northern part of Site M13 and comprises approximately 10.5 acres. Site features at Landfill M13 and surrounding areas are illustrated on Figure 3-16. Disposal activities were confined to four discrete areas on the site, none of which extended beyond 12 acres in size. Historical records indicate landfilling took place in the Northern Gravel Pit during the period 1966 to 1984 and involved scrap metals, creosote-treated railroad ties, telephone poles, and construction/demolition debris. Other waste management activities at Site M13 involved explosives. Explosive compounds observed in the groundwater at Site M13 include: TNT, TNB, 2,4-DNT, and 2,6-DNT.

Soil in the vicinity of the Northern Gravel Pit had been found to contain beryllium, lead, and benzo(a)pyrene as COCs. On a single occasion in 1991, antimony and cadmium were reported to be present in groundwater samples at concentrations in excess of their respective RGs, but they have not exceeded the RGs since. It is difficult to determine if the original findings could have resulted from turbid samples since low flow sampling and micro purging techniques are now employed to obtain more representative samples.

The current CSM is that metals and benzo(a)pyrene in groundwater may be present as a result of leaching of waste materials in the Northern Gravel Pit. The explosives present in groundwater are far more likely to be present due to infiltration of wastewater in the TNT Ditch. There is no evidence to suggest explosive compounds were ever present in waste materials put into the pit.

The Northern Gravel Pit was consolidated and capped (Landfill M13) in the 2007 to 2008 time frame. The three other pits received waste materials that do not appear to pose a threat to human health and the environment.

With the implementation of the RA at the TNT Ditch and the capping of the Northern Gravel Pit, it is anticipated that contaminants in site groundwater will detach from the source areas and migrate as legacy plumes to the west. As such, concentrations are expected to decline with time.

Monitoring at Landfill M13 is mandated by IAC Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for a period of 15 years. Long-term monitoring of the landfill cap will include quarterly inspections of the cap, vegetation, and drainage structures. Objectives include:

- Confirm that the cap has controlled leaching at the landfill so that water quality will not be threatened in the future;
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed;
- Keep survey points protected and visible to facilitate identification in the future;
- Ensure the fence and signage installed to restrict site access remain in place and serviceable; and
- Certify that institutional controls remain in place.

The overburden aquifer primarily consists of silt and clay, with abundant sand and gravel in the upper, unsaturated, portion of the aquifer. The overburden thickness is approximately 25 ft and is fairly consistent across Site M13. Samples from overburden wells are obtained from silt and/or clay layers.

3.6.1 Groundwater Hydraulics

The groundwater monitoring network at Landfill M13 consists of 11 wells: 6 overburden wells, 1 combined overburden/bedrock well and 4 bedrock wells. Water levels are measured at the groundwater locations that are sampled (listed below), and at monitoring wells MW350, MW363, and MW364. Monitoring well information and water levels for February and April are summarized in Table 2-2. The groundwater flow direction in the overburden aquifer for the February and April quarterly sampling events is to the south/southeast as shown on Figures 3-16 and 3-17, respectively. Figure 3-17 includes the surrounding groundwater flow taken from the semi-annual sampling event, as shown on Figure 3-10.

The horizontal gradient at Site M13 was calculated to be 0.0048 ft/ft in February and 0.0047 ft/ft in April (Table 3-6). Using an average hydraulic conductivity value of 8.0E-02 cm/sec and an assumed porosity of 0.30, the calculated flow velocity at Site M13 was approximately 3.6 ft/day or 1,296 ft/yr in February and in April (Table 3-7). Chemical data do not support this high of a flow velocity and linear flow velocities are likely on the order of 10 ft/yr based on data from other sites at JOAAP.

The groundwater flow direction in the bedrock aquifer in the immediate vicinity of Landfill M13 for February and April quarterly sampling events was generally toward the southwest as shown on Figures 3-18 and 3-19. Figure 3-19 includes the surrounding groundwater

flow taken from the April semi-annual sampling event, as shown on Figure 3-11. The screens for combination well MW350 and nearby bedrock well MW321 are set at a shallow depth within the bedrock aquifer (<10 ft below top of bedrock), while the well screen for nearby well MW322 is set at an intermediate depth within the bedrock aquifer (10 to 20 ft below top of bedrock). Downward vertical gradients were observed at upgradient well nest MW806/MW807 in February and April and downgradient well nests MW363/MW364 in February and MW808/MW809 in February and April. An upward vertical gradient was observed at downgradient well nests MW126R/MW362 in February and April and MW363/MW364 in April (Table 3-8).

The overburden and bedrock aquifer flow directions are consistent with flow directions observed historically.

3.6.2 Analytical Results

Groundwater sampling points for Landfill M13 within the MFG GMZ for the spring 2012 sampling events (quarterly) are summarized in Table 2-1. Monitoring wells AEHA14R and AEHA15 were not sampled in Spring 2012 as recommended in the 2010 Annual Report. The following monitoring wells at Landfill M13 are sampled for VOCs, SVOCs, TAL metals, explosives, nitrate, and sulfate:

- Upgradient MW806 and MW807
- Downgradient MW126R, MW362, MW808, and MW809

Groundwater samples were collected at Landfill M13 in February and April, 2012 and were analyzed for explosive compounds, TAL metals, indicator parameters (sulfate and nitrate), VOCs, and SVOCs in accordance with Appendix B (QAPP) of the LTM Plan. Detections of explosive compounds, TAL metals, indicator parameters (sulfate and nitrate), VOCs, and SVOCs for the sampling events conducted at Landfill M13 in spring 2012 are summarized in Tables 3-1, 3-2, 3-3, 3-4, and 3-5, respectively. Explosive compound detections are shown on Figure 3-20. For Landfill M13 the monitoring well locations are classified as upgradient or downgradient locations. A brief discussion of analytical results by well type follows:

Upgradient (MW806 and MW807): There were no detections of explosive compounds for the February or April sampling events.

There were no RG exceedances for metals for the February or April sampling events.

There were no RG exceedances for nitrate or sulfate for the February or April sampling events.

There were no RG exceedances for VOCs for the February or April sampling events. However, at monitoring well MW807, carbon disulfide (2.4 ug/L), 1,1-DCA (1.4 μ g/L), and cis-1,2-DCE (0.79 μ g/L) were detected below their respective RGs.

There were no detections of SVOCs for the February or April sampling events.

Downgradient (AEHA14R, AEHA15, MW126R, MW362, MW808, and MW809): There were no detections of explosive compounds at monitoring wells MW808, or MW809 for the February or April sampling events. At monitoring well MW126R, 2-NT and 4-NT were detected below their respective RGs for the April sampling event.

At monitoring well MW362, 2,4-DNT exceeded the RG for the February (1.5 ug/L) and April (4.9 ug/L) sampling events and 2-NT and 3-NT were detected at concentrations below their respective RGs for the April sampling event. In addition, TNT degradation products 2-A-4,6-DNT and 4-A-2,6-DNT were also detected at MW362 at low concentrations for the February and April sampling events.

At monitoring well AEHA15, iron was detected above the RG at a concentration of 15 mg/L for the February sampling event.

There were no RG exceedances for nitrate or sulfate for the February or April sampling events.

At monitoring well MW126R, trichloroethene was detected at a concentration of 0.23 ug/L below the RG for the April sampling event.

At monitoring well MW362, 2,4-DNT was not detected in February as it was in the explosives analysis, but exceeded the RG at a concentration of 3.3 ug/L in April which confirmed the exceedance in the explosives analysis.

3.6.3 Recommendations

Sampling at Landfill M13 should be performed during quarterly summer and fall 2012 sampling events as outlined in Table 3-9. An evaluation of the 2,4-DNT exceedances detected at monitoring well MW362 will be completed in the 2012 Annual Groundwater Monitoring Report to include analytical data from the remaining 2012 quarterly sampling events. A monitoring well should be installed downgradient of Site M13 to replace monitoring wells AEHA14R and AEHA15.

4.0 SUMMARY OF RECOMMENDATIONS

Recommendations included in previous LTM Plan reports relevant to modifications to the Long-Term Monitoring Program are summarized in Table 4-1. The following presents additional recommendations.

- The monitoring program as outlined in Table 3-9 should be implemented for the Fall 2012 sampling event.
- At Landfill L3 the rip rap along Prairie Creek at Site L3 has been washed away at several locations and is in need of repair.
- A monitoring well should be installed downgradient of Site M13 to replace monitoring wells AEHA14R and AEHA15.
- Required monitoring well repairs summarized in Section 2.1.2 will be completed during the fall 2012 sampling round.

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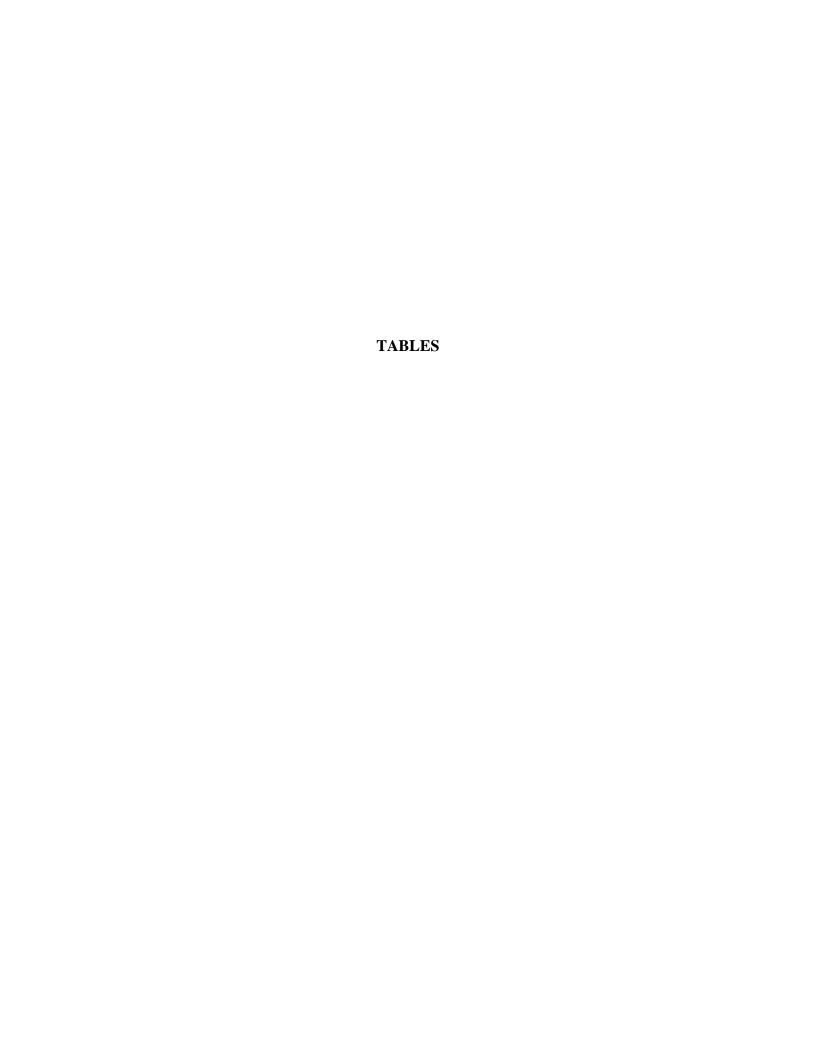


TABLE 1-1

Spring 2012 Sample Parameters 2012 Semi-Annual Groundwater Monitoring Report **Joliet Army Ammunition Plant** Will County, Illinois

Site	Well ID	Parameter
L1	In-plume	
	MW131	Е
	MW173	E
	WES1	E
	Early Warni	ng
	WES3	Е
	MW174	E
	Complianc	
	SW550	E
L3/	Upgradien	
Landfill L3	SW004	E, M
	In-plume/Downg	
	MW410	Е
	MW412	E, M
	Early Warning/Dow	
	MW630	E, M
	MW631	E, M
	MW633	E, M
	Compliance/Down SW777	gradient E, M
	Downgradie SW557	E, M
	SW558	E, M
M1	In-plume	15, 191
	MW107	S
	MW231	S
	MW640	S
	MW641	S
	MW642	S
	Early Warni	
	MW643	S
	MW644	S
	Complianc	e
	MW645	S
	MW646	S
	MW648	S
	MW649	S
	SW709	S
MFG	In-plume	
	MW212R	Е
	MW330	S
	MW652	Е
	Early Warni	
	MW123R	E
	MW124R	E
	MW162R	E
	MW313	E
	MW318	E
	MW319	<u>Е</u> Е
	MW654 Complianc	
	MW117	E
	MW117 MW118	E
	MW118 MW119	E E
Landfill M11	Upgradien	
Zandim MIII	MW802	E, I, M, SVOC & V
	Downgradie Downgradie	
	MW335	E, I, M, SVOC & V
	MW336	E, I, M, SVOC & V
	MW805	E, I, M, SVOC & V
Landfill M13 ⁽¹⁾	Upgradien	
	MW806	E, I, M, SVOC & V
	MW807	E, I, M, SVOC & V
	Downgradie	
	MW126R	E, I, M, SVOC & V
	MW362	E, I, M, SVOC & V
	MW808	E, I, M, SVOC & V
	MW809	E, I, M, SVOC & V

General Notes: E - Explosives M - Metals

M - Metals
S - Sulfate
MFG - Manufacturing Area
I - Indicator parameters (Nitrate-N and Sulfate)
SVOC - Semivolatile Organic Compounds
V - Volatile Organic Compounds (VOCs)

Footnotes:
(1) Site M13 Landfill monitoring wells were also sampled quarterly in February for these parameters in compliance with Illinois Administrative Code, including wells AEHA14R and AEHA15.

Table 2-1

Final Field Stabilization Parameters 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

				La la			1	
			ТТ	Specific	Tumbidia	Dissolved	Tommonotomo	Dodou
Site	Well ID	Sample Date	pH (SU)	Conductivity (mS/cm)	Turbidity (NTU)	Oxygen (mg/L)	Temperature (°C)	Redox (mV)
L1			(/	In-plun	, ,	(8 /	(- /	(' ')
	MW131	4/12/2012	7.06	1160	0.2	8.03	9.7	190
	MW173	4/11/2012	7.34	811	0.4	4.58	9.0	89
	MW174	4/11/2012	7.32	823	0.4	2.77	8.4	-18
	WES1	4/12/2012	7.31	839	0.0	6.77	12.8	179
				Early War	ning			
	WES3	4/11/2012	7.20	775	0.0	0.39	13.2	140
				Compliar	псе			
	SW550	4/14/2012	7.67	899	Moderate	15.61	10.4	12.3
L3				Upgradie	ent			
	SW004	4/10/2012	8.00	720	Moderate	10.39	14.5	176
				In-plume/Down	ngradient			
	MW410	4/11/2012	7.57	940	12.8	2.31	11.2	115
	MW412	4/11/2012	7.41	819	10.4	6.14	8.4	139
				arly wWarning/D				
	MW630	4/11/2012	7.42	766	3.6	6.90	8.8	113
	MW631	4/11/2012	7.53	692	7.1	0.95	9.6	157
	MW633	4/11/2012	7.53	677	9.2	3.54	8.8	135
				Compliance/Dow			I	
	SW777	4/11/2012	8.31	692	Moderate	11.14	13.7	124
	awy 5 5 7	4/10/2010	0.04	Downgrad		10.05		140
	SW557 SW558	4/10/2012 4/10/2012	8.34 8.67	710 682	Moderate Slight to Clear	10.05 10.97	14.5 9.5	149 148
M1	3 W 330	4/10/2012	6.07	In-plum	U	10.97	9.3	140
1411	MW107	4/12/2012	9.76	4790	3.3	0.59	11.4	-122
	MW231	4/12/2012	9.70	5940	0.0	0.39	10.3	-122
	MW640	4/12/2012	6.90	9360	6.1	2.54	11.4	-63
	MW641	4/12/2012	7.37	2300	6.9	2.92	9.8	-100
	MW642	4/12/2012	7.47	1500	2.6	1.96	10.4	28
	1.1., 0.2	12, 2012		Early War			-5	=0
	MW643	4/13/2012	7.65	839	5.5	8.70	10.1	-47
	MW644	4/13/2012	7.70	1090	0.0	3.41	10.0	130
				Compliar	псе		l	
	MW645	4/13/2012	7.44	839	1.3	2.22	9.5	108
	MW646	4/13/2012	7.76	903	0.8	4.13	9.9	115
	MW648	4/12/2012	7.62	643	25.9	0.75	9.7	-122
	MW649	4/13/2012	7.60	684	0.4	1.54	10.0	85
	SW709	4/13/2012	7.01	750	Moderate	11.11	12.0	14.1
MFG		-		In-plum				
	MW212R	4/15/2012	7.51	753	2.1	6.90	10.8	83
	MW330	4/17/2012	7.30	1370	13.5	5.39	12.6	125
	MW652	4/14/2012	7.23	1290	0.0	0.95	9.8	43
				Early War			T	
	MW123R	4/14/2012	6.97	1240	2.3	0.23	11.2	-60
	MW124R	4/14/2012	7.07	713	9.1	0.00	9.9	-70
	MW162R	4/14/2012	7.07	1140	0.0	2.00	11.1	0
	MW313	4/15/2012	7.77	1020	0.0	0.34	14.5	55
	MW318	4/14/2012	7.36	1230	0.1	0.00	10.4	-107
	MW319	4/14/2012	7.55	1330	0.7	1.94	11.5	-45
	MW654	4/15/2012	7.54	1980 Compliar	0.0 ice	1.79	11.0	60
	MSV117	4/12/2012	7.00			7 1 1	10.2	112
	MW117 MW118	4/13/2012 4/13/2012	7.08 7.58	950 742	1.7	7.11 1.75	10.3 9.8	-113 97
	MW118 MW119	4/13/2012	7.38	1910	4.6	0.00	9.8	70
	1V1 VV 117	4/13/2012	1.40	1710	4.0	0.00	7.0	70

Table 2-1

Final Field Stabilization Parameters 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

Site	Well ID	Sample Date	pH (SU)	Specific Conductivity (mS/cm)	Turbidity (NTU)	Oxygen (mg/L)	Temperature (°C)	Redox (mV)
Landfill M11				Upgradie	nt			
	MW802	4/16/2012	7.51	741	2.6	0.84	10.0	-6
				Downgradi	ient			
	MW335	4/16/2012	7.61	1890	1.1	4.35	9.1	121
	MW336	4/16/2012	7.60	1400	4.2	2.31	9.3	88
	MW805	4/16/2012	7.77	1510	10.3	3.95	10.3	95
Landfill M13				Upgradie	nt			
	MW806	2/29/2012	7.71	751	21.1	5.23	11.7	-43
		4/16/2012	7.66	838	0.0	0.99	11.9	61
	MW807	2/29/2012	7.53	3610	0.0.	0.93	11.9	-163
		4/16/2012	7.27	3790	0.0	0.38	13.4	-104
				Downgradi	ient			
	AEHA14R	3/1/2012	NM	NM	NM	NM	NM	NM
	AEHA15	3/1/2012	NM	NM	NM	NM	NM	NM
	MW126R	2/29/2012	7.50	1111	18.3	4.11	10.6	37
		4/16/2012	7.41	792	0.0	0.67	12.2	29
	MW362	2/29/2012	7.60	3028	12.0	3.16	11.8	67
		4/16/2012	7.35	2860	0.7	3.81	12.4	108
	MW808	2/29/2012	7.00	1635	10.6	2.11	11.6	-78
		4/16/2012	7.16	1430	3.2	4.09	10.4	-52
	MW809	2/29/2012	7.95	623	10.0	5.00	11.8	-165
		4/16/2012	7.83	536	1.3	5.36	12.0	-59

General Notes:

ID = identification

SU = standard units

 $mS/cm = microsiemens \ per \ centimeter$

 $NTU = nephelometric \ turbidity \ unit$

mg/L = milligrams per liter

 $^{\circ}C = degrees \ Centigrade$

mV = millivolt

R = Replacement well

 $NM = not \ measured$

 $Redox = reduction/oxidation\ potential$

Wells AEHA14R and AEHA15 were not able to be purged prior to collecting a sample. Therefore stabilization criteria were not measured.

TABLE 2-2

Monitoring Well Information - Manufacturing Area 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

						Depth to	Depth to	Total	Depth to	Water	Depth to	Water	Depth to	Bedrock				Casing &
				тос	Ground	Top of	Bottom of	Borehole	Water	Elevation	Water	Elevation	Bedrock	Elevation			Screen	Screen
Area/Well		Northing	Easting	Elevation	Elevation	Screen	Screen	Depth	February 2012	February 2012	April 2012	April 2012	From Log	from Log	Year	Formation	Length	Diameter
ID	Site	(Feet)	(Feet)	(MSL)	(MSL)	(BGS)	(BGS)	(BGS)	(TOC)	(MSL)	(TOC)	(MSL)	(BGS)	(MSL)	Installed	Designation	(Feet)	(Inches)
MW104	M1	15019989.44	1318790.51	549.10	546.20	7.0	27.0	30.0	NM	NM	6.05	543.05	27.00	519.20	1981	OVB	20.0	4.0
MW105		15020111.69	1320854.13	555.00	552.50	7.0	27.0	29.9	NM	NM	6.01	548.99	24.00	528.50	1981	COMBO	20.0	4.0
MW106		15020948.76	1318761.26	542.00	539.70	10.0	30.0	32.0	NM	NM	3.60	538.40	21.00	518.70	1981	COMBO	20.0	4.0
MW107		15021094.20	1320422.28	552.40	549.10	5.5	25.5	27.4	NM	NM	6.06	546.34	17.00	532.10	1981	COMBO	20.0	4.0
MW201		15020020.57	1318931.61	546.15	544.01	46.5	66.5	70.5	NM	NM	2.88	NM	24.00	520.01	1988	BRK	20.0	4.0
MW231		15020828.13	1319861.02	550.33	548.47	6.0	16.0	15.7	NM	NM	3.99	546.34	16.00	532.47	1988	OVB	10.0	4.0
MW347		15020481.00	1319594.96	551.73	549.84	14.4	24.4	27.0	NM	NM	4.81	NM	18.50	531.34	1991	COMBO	10.0	4.0
MW351		15021257.77	1319798.88	548.38	545.68	9.5	19.5	22.7	NM	NM	4.91	543.47	22.50	523.18	1991	OVB	10.0	4.0
MW640		15021244.24	1319804.02	548.12	545.40	29.0	39.0	40.0	NM	NM	3.95	544.17	23.00	522.40	1999	BRK	10.0	4.0
MW641		15021873.45	1319350.19	544.50	541.98	7.0	17.0	17.2	NM	NM	2.22	542.28	29.00	516.08	1999	OVB	10.0	4.0
MW642		15021874.37	1319339.91	544.47	541.95	29.0	39.0	40.0	NM	NM	2.75	541.72	29.00	516.08	1999	OVB	10.0	4.0
MW643		15022117.67	1318719.85	540.03	537.55	4.3	7.2	7.8	NM	NM	6.73	533.30	7.25	530.30	2001	OVB	2.9	4.0
MW644		15022128.91	1318718.61	540.23	537.55	10.8	20.4	21.0	NM	NM	6.22	534.01	7.25	530.30	2001	BRK	9.6	4.0
MW645		15022269.11	1318648.69	541.47	538.90	7.5	11.5	12.0	NM	NM	8.53	532.94	10.50	528.40	2001	OVB	4.0	4.0
MW646		15022257.26	1318650.53	541.48	539.09	12.3	21.9	22.5	NM	NM	8.49	532.99	10.50	528.59	2001	BRK	9.6	4.0
MW647		15022572.85	1318012.98	538.40	535.96	7.3	16.9	17.5	NM	NM	5.69	532.71	6.00	529.96	2001	OVB	9.6	4.0
MW648		15022428.25	1319438.13	546.77	544.17	7.3	16.8	17.4	NM	NM	6.03	540.74	13.50	530.67	2001	OVB	9.6	4.0
MW649		15021299.49	1318723.15	543.10	540.49	7.0	16.6	17.2	NM	NM	7.24	535.86	7.50	532.99	2001	OVB	9.6	4.0
MW111	M3	15028902.95	1318551.57	531.80	529.40	10.5	54.0	UNKNOWN	NM	NM	NM	NM	10.00	519.40	1981	BRK	43.5	4.0
MW112		15030353.67	1318557.88	534.10	531.70	7.2	27.2	UNKNOWN	NM	NM	NM	NM	8.00	523.70	1981	BRK	20.0	4.0
MW113		15030379.46	1319676.13	536.32	533.70	7.2	27.2	UNKNOWN	NM	NM	6.0	530.30	5.00	528.70	1981	BRK	20.0	4.0
MW154		15027749.55	1318572.52	533.06	529.15	5.5	9.1	UNKNOWN	NM	NM	NM	NM	8.00	521.15	1982	BRK	3.6	UNKNOWN
MW203		15029235.44	1318551.15	534.23	532.02	10.5	25.5	UNKNOWN	NM	NM	NM	NM	5.50	526.52	1988	BRK	15.0	4.0
MW232		15030123.95	1318974.36	535.79	533.38	20.0	35.0	UNKNOWN	NM	NM	NM	NM	7.00	526.38	1988	BRK	15.0	4.0
MW233		15029737.88	1319024.94	535.58	532.96	10.0	25.0	UNKNOWN	NM	NM	NM	NM	2.50	530.46	1988	BRK	15.0	4.0
MW348		15029911.26	1318978.02	535.71	532.61	16.5	31.5	UNKNOWN	NM	NM	NM	NM	3.00	529.61	1991	BRK	15.0	4.0
MW352		15029602.85	1318617.32	534.89	532.33	19.0	34.0	UNKNOWN	NM	NM	NM	NM	6.00	526.33	1991	BRK	15.0	4.0
MW353 MW115	MFG	15030120.63 15032589.49	1318562.29 1318485.27	534.64 533.40	531.86 530.80	17.0 7.2	32.0 27.2	UNKNOWN	NM NM	NM NM	NM 4.59	NM 528.81	2.00	529.86 528.80	1991 1981	BRK BRK	15.0 20.0	4.0
MW157	(M4)	15032589.49	1318485.27	535.40	530.80	3.7	10.2	UNKNOWN	NM NM	NM NM	4.68	528.81	11.00	528.80	1981	COMBO	6.5	2.0
MW157 MW158	(WI4)	15032947.33	1319827.02	534.40	531.58	9.0	29.5	31.9	NM	NM	4.06	530.34	5.00	526.58	1982	BRK	20.5	3.0
MW114R	MFG	15032970.89	1323651.56	556.80	554.9	6.5	29.5	22.0	NM	NM NM	4.00 NM	330.34 NM	15.00	539,90	2001	COMBO	15.0	4.0
MW127R	(M5)	15032537.25	1326273.84	596.04	592.9	30.0	45.0	46.0	NM	NM	42.29	553.75	40.00	552.90	2001	COMBO	15.0	4.0
MW207R	(112)	15032188.92	1323779.72	560.21	557.5	7.0	17.0	18.0	NM	NM	NM	NM	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
MW354R		15032780.18	1323424.19	559.61	557.6	7.0	17.0	18.0	NM	NM	13.69	545.92	19.00	538.60	2001	COMBO	10.0	4.0
MW355R		15030827.10	1323676.76	558.12	555.7	10.0	20.0	22.0	NM	NM	NM	NM	15.00	540.70	2001	COMBO	10.0	4.0
MW356R		15031372.45	1322053.98	558.08	556.1	24.5	34.5	35.0	NM	NM	16.05	542.03	20.00	536.10	2001	BRK	10.0	4.0
MW117	MFG	15036450.18	1318407.67	529.10	526.90	7.7	27.7	UNKNOWN	NM	NM	4.75	524.35	12.00	514.90	1981	COMBO	20.0	4.0
MW122	(M6)	15038443.33	1321304.96	540.10	537.40	7.0	27.0	UNKNOWN	NM	NM	4.60	535.50	6.50	530.90	1981	BRK	20.0	4.0
MW123R		15035314.93	1320626.07	537.22	534.9	15.0	30.0	32.0	NM	NM	5.48	531.74	10.00	524.90	2001	BRK	15.0	4.0
MW125R		15037201.55	1322981.58	567.69	565.1	12.0	32.0	33.0	NM	NM	14.27	553.42	26.00	539.10	2001	COMBO	20.0	4.0
MW160		15034274.88	1321203.86	542.29	538.20	3.3	6.3	10.4	NM	NM	6.83	535.46	6.00	532.20	1982	OVB	3.0	2.0
MW162R		15035325.72	1320625.78	540.19	537.7	4.5	9.5	10.0	NM	NM	5.41	534.78	UNKNOWN	UNKNOWN	2001	OVB	5.0	4.0
MW164		15037035.66	1321868.53	545.21	541.69	3.0	6.0	9.7	NM	NM	6.49	538.72	6.00	535.69	1982	OVB	3.0	4.0
MW165		15037644.18	1321700.33	544.01	540.31	2.8	5.3	9.0	NM	NM	5.80	538.21	5.00	535.31	1982	OVB	2.5	4.0
MW166R		15039129.45	1322674.99	558.21	555.6	10.0	20.0	21.0	NM	NM	13.70	544.51	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
MW208		15035028.45	1320126.91	538.38	535.10	12.0	27.0	30.1	NM	NM	5.91	532.47	4.00	531.10	1988	BRK	15.0	4.0
MW209		15037473.35	1320271.28	537.75	534.89	19.5	34.5	UNKNOWN	NM	NM	4.37	533.38	11.10	523.79	1988	BRK	15.0	4.0
MW210R		15035465.00	1322154.00	565.83	564.30	10.7	20.0	20.0	NM	NM	10.74	555.09	UNKNOWN	UNKNOWN	1998	OVB	10.0	4.0
MW212R		15035415.00	1321862.00	567.74	565.30	9.5	19.5	21.0	NM	NM	14.74	553.00	UNKNOWN	UNKNOWN	1998	OVB	10.0	4.0
MW213R		15035462.00	1322159.00	566.49	564.30	38.0	53.0	54.0	NM	NM	19.47	547.02	30.50	533.80	1998	BRK	15.0	4.0

TABLE 2-2

Monitoring Well Information - Manufacturing Area 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

r			1	1	T	T	T		T	1		T	T					
						Depth to	Depth to	Total	Depth to	Water	Depth to	Water	Depth to	Bedrock				Casing &
				TOC	Ground	Top of	Bottom of	Borehole	Water	Elevation	Water	Elevation	Bedrock	Elevation			Screen	Screen
Area/Well		Northing	Easting	Elevation	Elevation	Screen	Screen	Depth	February 2012	February 2012	April 2012	April 2012	From Log	from Log	Year	Formation	Length	Diameter
ID	Site	(Feet)	(Feet)	(MSL)	(MSL)	(BGS)	(BGS)	(BGS)	(TOC)	(MSL)	(TOC)	(MSL)	(BGS)	(MSL)	Installed	Designation	(Feet)	(Inches)
MW215R	MFG	15035410.00	1321863.00	567.27	565.30	38.5	53.5	54.5	NM	NM	21.12	546.15	30.00	535.30	1998	BRK	15.0	4.0
MW307	(M6)	15033821.00	1321855.79	563.56	561.45	17.0	27.0	31.7	NM	NM	19.55	544.01	UNKNOWN	UNKNOWN	1991	OVB	10.0	4.0
MW308		15033810.75	1321837.62	563.84	561.38	50.5	65.5	71.8	NM	NM	21.58	542.26	35.00	526.38	1991	BRK	15.0	4.0
MW309		15034826.80	1321825.25	565.59	563.43	12.7	27.7	30.6	NM	NM	11.26	554.33	30.00	533.43	1991	OVB	15.0	4.0
MW310R		15034823.00	1321824.00	565.17	563.00	44.5	59.5	60.0	NM	NM	22.06	543.11	31.00	532.00	1998	BRK	15.0	4.0
MW311		15038100.41	1322342.54	548.85	546.36	14.0	24.0	26.4	NM	NM	1.31	547.54	7.00	539.36	1991	BRK	10.0	4.0
MW312	MFG	15038100.56	1322332.55	548.59	545.96	40.0	55.0	58.1	NM	NM	1.04	547.55	7.00	538.96	1991	BRK	15.0	4.0
MW313	(M6)	15037051.68	1321933.96	551.07	549.20	25.0	40.0	40.9	NM	NM	12.03	539.04	12.00	537.20	1991	BRK	15.0	4.0
MW314		15034383.61	1321451.49	542.32	539.53	9.7	14.7	17.8	NM	NM	6.90	535.42	7.20	532.33	1991	BRK	5.0	4.0
MW315		15034394.61	1321451.65	541.60	538.91	29.7	44.7	47.9	NM	NM	6.19	535.41	6.50	532.41	1991	BRK	15.0	4.0
MW316		15036232.25	1321257.09	542.89	540.49	13.0	18.0	20.9	NM	NM	6.15	536.74	7.50	532.99	1991	BRK	5.0	4.0
MW317		15036222.43	1321257.70	542.96	540.71	34.0	49.0	UNKNOWN	NM	NM	6.68	536.28	8.00	532.71	1991	BRK	15.0	4.0
MW318		15037189.67	1321488.64	547.67	545.23	11.8	21.8	24.2	NM	NM	10.12	537.55	11.50	533.73	1991	BRK	10.0	4.0
MW319	1	15037202.65	1321489.84	548.10	545.49	40.0	55.0	57.0	NM	NM	10.43	537.67	12.00	533.49	1991	BRK	15.0	4.0
MW320R	1	15039129.65	1322656.01	557.09	554.6	30.5	45.5	46.0	NM	NM	12.46	544.63	UNKNOWN	UNKNOWN	2001	OVB	15.0	4.0
MW650	İ	15037950.23	1322587.98	566.45	563.83	12.0	22.0	22.5	NM	NM	10.84	555.61	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW651		15037939.17	1322583,70	566.88	563,83	36.0	46.0	47.0	NM	NM	18.29	548.59	23.00	560.83	1999	BRK	10.0	4.0
MW652	1	15037004.90	1322243.13	565.03	561.93	11.0	21.0	22.0	NM	NM	11.31	553.72	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW653	1	15036994.58	1322239.14	564.60	561.93	36.0	46.0	47.0	NM	NM	17.69	546.91	25.00	536.93	1999	BRK	10.0	4.0
MW654	<u> </u>	15037070,77	1321976,938,79	551.15	548.49	13.0	23.0	24.0	NM	NM	12.55	538.60	10.50	539.00	1999	BRK	10.0	4.0
MW655	<u> </u>	15034232.30	1320633.23	540.19	537.71	UNKNOWN	UNKNOWN	UNKNOWN	NM	NM	7.46	532.73	5.00	532.70	1999	BRK	UNKNOWN	4.0
MW662		15039862.64	1321841.47	547.56	UNKNOWN	6.0	16.0	18.0	NM	NM	9.15	538.41	20.00	UNKNOWN	2001	OVB	10.0	4.0
MW663		15039854.92	1321841.41	547.86	UNKNOWN	30.0	40.0	41.0	NM	NM	9.31	538.55	20.00	UNKNOWN	2001	BRK	10.0	4.0
MW664	-	15040136.57	1321841.41	547.43	UNKNOWN	5.0	10.0	10.5	NM NM	NM	8.62	538.81	10.00	UNKNOWN	2001	OVB	5.0	4.0
MW665	•	15040136.37	1322320.42	546.98	UNKNOWN	28.0	38.0	40.0	NM	NM	4.94	542.04	10.00	UNKNOWN	2001	BRK	10.0	4.0
) mc										2.90							
MW124R	MFG	15033133.00	1320756.00	537.25	534.70	6.0	16.0	16.0	NM	NM		534.35	5.00	UNKNOWN	1998	BRK	10.0	4.0
MW156	(M7)	15032408.65	1321713.49	541.35	537.45	1.7	5.2	UNKNOWN	NM	NM	5.84	535.51	5.30	532.15	1982	OVB	3.5	4.0
MW159		15033457.92	1320537.11	537.80	533.54	4.4	9.4	12.8	NM	NM	6.62	531.18	5.70	527.84	1982	COMBO	5.0	4.0
MW216	-	15033525.60	1320650.62	538.03	536.51	5.0	10.0	36.7	NM	NM	6.60	531.43	11.00	525.51	1988	OVB	5.0	4.0
MW217		15033449.66	1320652.62	538.97	536.90	19.5	34.5	12.0	NM	NM	7.03	531.94	13.40	523.50	1988	BRK	15.0	4.0
MW321		15033167.53	1321626.52	545.55	542.93	13.5	23.5	26.6	NM	NM	7.82	537.73	9.50	533.43	1991	BRK	10.0	4.0
MW322		15033161.04	1321640.23	544.54	542.26	34.5	49.5	51.5	NM	NM	10.75	533.79	9.00	533.26	1991	BRK	15.0	4.0
MW660		15032597.24	1320677.38	539.73	537.08	7.0	12.0	12.6	NM	NM	5.85	533.88	UNKNOWN	UNKNOWN	1999	OVB	5.0	4.0
MW661		15032587.16	1320679.22	539.57	537.09	20.0	30.0	30.0	NM	NM	6.75	532.82	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW147R	MFG	15037926.87	1323318.04	567.82	564.0	6.5	21.5	22.0	NM	NM	11.42	556.40	UNKNOWN	UNKNOWN	2001	OVB	15.0	4.0
MW148R	(M8)	15038954.52	1323542.19	561.59	560.7	8.0	23.0	23.5	NM	NM	15.90	545.69	18.00	542.70	2001	COMBO	15.0	4.0
MW323R		15036514.75	1323739.67	566.00	563.5	8.0	18.0	18.5	NM	NM	1.88	564.12	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
MW324R		15038125.44	1323502.88	566.23	562.7	9.5	19.5	20.0	NM	NM	15.78	550.45	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
MW325R		15036105.38	1322633.31	569.62	566.9	7.0	17.0	18.0	NM	NM	13.77	555.85	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
MW327R		15035974.93	1324366.55	565.27	562.57	13.5	18.5	19.0	NM	NM	12.31	552.96	17.00	UNKNOWN	2001	COMBO	5.0	4.0
MW121	MFG	15040140.83	1323725.54	575.75	572.50	10.0	30.0	14.2	NM	NM	18.92	556.83	UNKNOWN	UNKNOWN	1981	OVB	20.0	4.0
MW328	(M9)	15040352.78	1323793.00	582.93	580.72	18.0	28.0	19.7	NM	NM	24.68	558.25	UNKNOWN	UNKNOWN	1991	OVB	10.0	4.0
MW330		15040218.36	1323970.19	580.33	578.20	15.0	25.0	17.0	NM	NM	22.35	557.98	UNKNOWN	UNKNOWN	1991	OVB	10.0	4.0
MW116	MFG	15034538.62	1318460.26	535.20	532.60	7.0	27.0	UNKNOWN	NM	NM	6.33	528.87	5.00	527.60	1981	BRK	20.0	4.0
MW118	(Other Areas)	15039343.51	1318362.19	534.00	531.20	8.0	23.0	UNKNOWN	NM	NM	3.71	530.29	2.50	528.70	1981	BRK	15.0	4.0
MW119]	15040962.12	1320127.86	538.90	535.50	3.3	23.3	UNKNOWN	NM	NM	6.21	532.69	6.00	529.50	1981	BRK	20.0	4.0
MW108	M11	15025248.13	1320261.16	543.60	540.80	7.0	27.0	UNKNOWN	NM	NM	7.97	535.63	9.00	531.80	1981	BRK	20.0	4.0
MW333		15026529.41	1319776.92	536.41	533.63	17.9	32.9	UNKNOWN	NM	NM	2.78	533.63	5.00	528.63	1991	BRK	15.0	4.0
MW334		15025998.41	1319521.79	536.22	533.40	19.0	34.0	UNKNOWN	NM	NM	3.41	532.81	5.00	528.40	1991	BRK	15.0	4.0
MW335		15025998.41	1319321.79	538.36	535.66	9.4	19.4	UNKNOWN	NM	NM	6.11	532.25	6.00	529.66	1991	BRK	10.0	4.0
MW336		15025322.08	1319304.79	537.28	534.79	12.0	22.0	UNKNOWN	NM NM	NM	7.65	529.63	7.50	527.29	1991	BRK	10.0	4.0
MW336 MW337	 	15025322.08	1319223.43	537.28	534.79	21.1	36.1	UNKNOWN	NM NM	NM NM	5.71	529.63	6.50	527.82	1991	BRK	15.0	4.0
1 CC vv 1v1	l l	13024991.97	1317103.37	330.90	JJ4.32	41.1	J0.1	UNKNOWN	1 4141	14141	٥./١	JJ1.4J	0.30	341.04	1 77 1	7/10	13.0	4.0

Monitoring Well Information - Manufacturing Area 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

						Depth to	Depth to	Total	Depth to	Water	Depth to	Water	Depth to	Bedrock				Casing &
				TOC	Ground	Top of	Bottom of	Borehole	Water	Elevation	Water	Elevation	Bedrock	Elevation			Screen	Screen
Area/Well		Northing	Easting	Elevation	Elevation	Screen	Screen	Depth	February 2012	February 2012	April 2012	April 2012	From Log	from Log	Year	Formation	Length	Diameter
ID	Site	(Feet)	(Feet)	(MSL)	(MSL)	(BGS)	(BGS)	(BGS)	(TOC)	(MSL)	(TOC)	(MSL)	(BGS)	(MSL)	Installed	Designation	(Feet)	(Inches)
MW338	M11	15024414.06	1318777.52	537.73	534.70	13.5	28.5	UNKNOWN	NM	NM	5.28	532.45	3.00	531.70	1991	BRK	15.0	4.0
MW339		15023897.93	1318660.60	541.27	538.41	9.7	19.7	UNKNOWN	NM	NM	8.44	532.83	9.00	529.41	1991	BRK	10.0	4.0
MW340		15023157.68	1318683.22	542.47	539.83	7.0	17.0	UNKNOWN	NM	NM	8.70	533.77	10.00	529.83	1991	COMBO	10.0	4.0
MW802		15025690.00	1320235.70	543.42	541.62	5.0	15.0	15.0	NM	NM	6.69	536.73	9.50	532.12	2008	COMBO	10.0	4.0
MW803		15025697.70	1320237.50	543.66	541.56	26.5	36.5	36.5	NM	NM	3.39	540.27	9.50	532.06	2008	BRK	10.0	4.0
MW804		15025916.10	1319219.30	536.48	533.78	5.0	15.0	15.0	NM	NM	5.07	531.41	3.50	530.28	2008	COMBO	10.0	4.0
MW805		15025913.60	1319229.60	536.27	533.62	25.0	35.0	35.0	NM	NM	5.18	531.09	3.50	530.12	2008	BRK	10.0	4.0
AEHA14R	M13	15034927.28	1322519.89	569.73	567.03	16.5	26.5	27.0	17.76	551.97	17.83	551.90	UNKNOWN	UNKNOWN	2001	OVB	10.0	4.0
AEHA15		15034695.41	1322493.87	570.38	567.32	UNKNOWN	UNKNOWN	36.5	20.17	550.21	21.07	549.31		567.32	UNKNOWN	OVB	UNKNOWN	2.0
MW126R		15034092.63	1323332.31	562.41	563.00	11.0	21.0	22.0	16.03	546.38	15.95	546.46	UNKNOWN	UNKNOWN	2004	OVB	10.0	4.0
MW350		15032810.11	1321811.02	554.34	552.34	12.5	22.5	24.8	NM	NM	15.58	538.76	19.00	533.34	1991	COMBO	10.0	4.0
MW362		15034100.64	1323339.44	562.46	562.78	28.0	33.0	34.0	13.11	549.35	13.25	549.21	29.50	533.28	2004	BRK	5.0	4.0
MW363		15032768.31	1322536.05	570.03	567.66	21.0	31.0	32.0	27.85	542.18	27.90	542.13	31.50	536.16	2004	OVB	10.0	4.0
MW364		15032775.38	1322527.16	569.82	567.69	37.0	42.0	42.5	27.72	542.10	27.68	542.14	31.50	536.19	2004	BRK	5.0	4.0
MW806		15034807.20	1323337.90	565.53	UNKNOWN	15.0	25.0	25.0	13.98	551.55	14.09	551.44	29.00	UNKNOWN	2008	OVB	10.0	4.0
MW807		15034817.40	1323338.10	565.79	UNKNOWN	35.0	45.0	45.0	15.41	550.38	15.63	550.16	29.00	UNKNOWN	2008	BRK	10.0	4.0
MW808		15034539.90	1322493.10	569.23	UNKNOWN	15.0	25.0	25.0	17.38	551.85	17.09	552.14	30.00	UNKNOWN	2008	OVB	10.0	4.0
MW809		15034530.20	1322492.90	569.18	UNKNOWN	35.0	45.0	45.0	20.11	549.07	20.32	548.86	30.00	UNKNOWN	2008	BRK	10.0	4.0

Notes:

Coordinates are Universal Transverse Mercator (UTM), Zone 16 East, North American Datum 1983 (NAD83)

UNKOWN = indicate data not presented on borelogs or provided in RI/FS documentation.

 $NM = Not \ Applicable, \ water \ levels \ not \ measured.$

BRK = Bedrock OVB = Overburden

COMBO = Combination Overburden and Bedrock Well

MSL = Feet relative to mean seal level

BGS = Feet below ground surface

ID = identification

TOC = Top of Casing

Monitoring Well Information - LAP Area 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

						D 41.4	D 41.4	TF 4.1	D 41.4	***	D 414	D 1 1				G : 0
				TO G	a 1	Depth to	Depth to	Total	Depth to	Water	Depth to	Bedrock			a a	Casing &
			·•	TOC	Ground	Top of	Bottom of	Borehole	Water	Elevation	Bedrock	Elevation			Screen	Screen
Area/Well	g.,	Northing	Easting	Elevation	Elevation	Screen	Screen	Depth	April 2012	April 2012	From Log	from Log	Year	Formation	Length	Diameter
ID	Site	(Feet)	(Feet)	(MSL)	(MSL)	(BGS)	(BGS)	(BGS)	(TOC)	(MSL)	(BGS)	(MSL)	Installed	Designation	(Feet)	(Inches)
MW131	L1	15029483.20	1344039.100	625.01	622.29	2.5	22.5	24.0	18.02	606.99	UNKNOWN	UNKNOWN	1981	OVB	20.0	4.0
MW171		15028774.67	1343406.032	618.24	615.03	2.9	7.9	11.1	10.75	607.49	8.00	607.03	1982	OVB	5.0	4.0
MW172		15028836.84	1344094.147	615.87	613.19	14.5	34.5	37.5	12.52	603.35	11.00	602.19	1982	BRK	20.0	4.0
MW173		15028827.26	1344123.204	615.56	612.56	2.8	11.8	15.2	12.25	603.31	12.00	600.56	1982	OVB	9.0	3.6
MW174		15028974.94	1344649.467	615.32	612.40	3.5	14.5	18.1	12.03	603.29	15.00	597.40	1982	OVB	11.0	3.6
MW175		15029420.69	1343046.596	634.45	630.96	3.7	19.7	23.2	15.14	619.31	20.00	610.96	1982	OVB	16.0	3.6
MW176		15030320.57	1343491.565	646.77	643.49	4.8	20.8	23.6	24.42	622.35	20.80	622.69	1982	OVB	16.0	3.6
MW177		15028773.31	1343380.183	616.29	613.84	11.8	31.0	33.4	7.99	608.30	6.50	607.34	1983	BRK	19.2	3.0
MW178		15030330.01	1343512.024	643.83	640.39	27.3	46.5	50.1	28.01	615.82	20.00	620.39	1983	BRK	19.2	3.0
MW400		15030872.22	1344840.211	655.17	652.56	16.2	26.2	28.6	NM	NM	21.00	631.56	1991	COMBO	10.0	4.0
MW401		15028228.22	1344007.476	611.96	610.20	28.5	43.5	46.1	10.46	601.50	16.00	594.20	1991	BRK	15.0	4.0
WES1		15029404.21	1343978.508	623.13	621.43	20.0	40.0	40.0	16.76	606.37	20.00	601.43	1997	BRK	20.0	4.0
WES2		15029874.92	1343699.213	637.69	635.98	22.0	42.0	42.0	26.11	611.58	22.00	613.98	1997	BRK	20.0	4.0
WES3		15028686.71	1344093.581	611.69	610.33	20.0	40.0	40.0	4.63	607.06	20.00	590.33	1997	BRK	20.0	4.0
MW610		15028213.06	1344005.102	612.63	609.62	4.0	14.0	14.0	11.22	601.41	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW611		15027976.15	1344327.569	620.45	617.83	10.0	20.0	21.0	14.01	606.44	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW132	L2	15026868.16	1339653.570	612.30	609.84	7.5	27.5	29.4	NM	NM	18.00	591.84	1981	COMBO	20.0	4.0
MW133		15026726.48	1338362.506	605.88	603.51	7.2	27.2	28.7	NM	NM	19.50	584.01	1981	COMBO	20.0	4.0
MW134		15025646.63	1338233.841	613.30	609.70	6.7	26.7	27.1	6.82	606.48	UNKNOWN	UNKNOWN	1981	OVB	20.0	4.0
MW135		15025761.10	1339631.781	637.35	634.18	6.0	26.0	27.0	NM	NM	UNKNOWN	UNKNOWN	1981	OVB	20.0	4.0
MW404		15026798.76	1338548.502	605.88	604.09	7.7	17.7	20.5	NM	NM	12.00	592.09	1991	COMBO	10.0	4.0
MW405		15027072.91	1338771.791	607.21	605.16	10.8	20.8	23.5	NM	NM	16.00	589.16	1991	COMBO	10.0	4.0
MW406		15026560.78	1339282.341	623.13	620.72	23.8	33.8	35.7	NM	NM	29.00	591.72	1991	COMBO	10.0	4.0
MW407		15026676.15	1339269.053	620.05	618.30	20.5	30.5	33.9	NM	NM	25.50	592.80	1991	COMBO	10.0	4.0
MW501		15025985.85	1338411.03	617.05	614.72	12.7	22.7	NA	NM	NM	25.00	589.72	1991	OVB	10.0	4.0
MW620		15027048.61	1338602.438	605.07	602.41	7.0	17.0	18.0	NM	NM	UNKNOWN	UNKNOWN	1999	OVB	10.0	4.0
MW621		15027058.70	1338599.038	604.96	602.41	22.0	32.0	32.8	NM	NM	20.00	582.41	1999	BRK	10.0	4.0
MW810		15027142.71	1338476.770	604.58	601.91	7.0	17.3	18.0	NM	NM	UNKNOWN	UNKNOWN	2009	OVB	10.0	4.0
MW1	L3	15025237.01	1338193.456	630.63	628.68	16.5	26.5	27.8	16.77	613.86	UNKNOWN	UNKNOWN	1986	OVB	10.0	2.0
MW136	-	15024523.06	1337305.702	602.70	600.8	7.2	27.2	NA	8.22	594.48	11.00	589.80	1981	COMBO	20.0	4.0
MW137		15024661.00	1338608.636	632.90	631.40	7.0	27.0	28.7	4.55	628.35	UNKNOWN	UNKNOWN	1981	OVB	20.0	4.0
MW3		15025504.29	1337801.715	610.34	608.50	9.0	19.0	20.9	4.87	605.47	19.00	589.50	1986	OVB	10.0	2.0
MW410		15025282.41	1337409.613	604.38	NA	8.0	18.0	20.3	12.06	592.32	UNKNOWN	UNKNOWN	1993	OVB	10.0	4.0
MW411		15024977.88	1337383.946	616.71	NA	13.0	23.0	25.1	19.10	597.61	18.00	594.54	1991	COMBO	10.0	4.0
MW412		15024596.02	1337101.399	599.14	597.41	7.4	17.4	19.2	6.48	592.66	3.00	594.41	1991	BRK	10.0	4.0

Monitoring Well Information - LAP Area 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

						Depth to	Depth to	Total	Depth to	Water	Depth to	Bedrock				Casing &
				TOC	Ground	Top of	Bottom of	Borehole	Water	Elevation	Bedrock	Elevation			Screen	Screen
Area/Well		Northing	Easting	Elevation	Elevation	Screen	Screen	Depth	April 2012	April 2012	From Log	from Log	Year	Formation	Length	Diameter
ID	Site	(Feet)	(Feet)	(MSL)	(MSL)	(BGS)	(BGS)	(BGS)	(TOC)	(MSL)	(BGS)	(MSL)	Installed	Designation	(Feet)	(Inches)
MW630	L3	15024770.15	1337013.674	595.06	592.23	7.0	12.0	12.7	6.73	588.33	4.00	588.20	1999	BRK	5.0	4.0
MW631		15024764.63	1337010.736	595.09	592.23	16.0	26.0	27.0	4.76	590.33	4.00	588.20	1999	BRK	10.0	4.0
MW632		15024828.58	1336912.350	606.25	603.75	12.0	27.2	27.5	15.89	590.36	UNKNOWN	UNKNOWN	2009	BRK	15.0	4.0
MW633		15024474.50	1336978.448	600.37	597.90	7.0	17.0	18.0	8.89	591.48	5.00	592.90	1999	BRK	10.0	4.0
H-7	L14	15019448.58	1332662.795	584.62	581.45	4.0	14.0	15.5	NM	NM	12.00	569.45	1982	OVB	10.0	2.0
H-8		15019409.64	1333457.292	591.40	588.14	7.0	22.0	22.9	NM	NM	20.00	568.14	1982	OVB	15.0	2.0
MW140		15018819.68	1332901.750	584.59	581.68	7.0	27.0	30.3	NM	NM	22.00	559.68	1981	COMBO	20.0	4.0
MW508		15019632.37	1333106.169	587.44	585.34	10.0	20.0	22.9	NM	NM	UNKNOWN	UNKNOWN	1993	OVB	10.0	4.0
MW511		15019645.92	1333029.631	587.79	584.98	4.0	14.0	17.0	NM	NM	16.00	568.98	1997	OVB	10.0	4.0
MW512		15019541.13	1333111.131	588.04	585.98	5.0	15.0	18.2	NM	NM	16.00	569.98	1997	OVB	10.0	4.0
MW600		15019920.13	1332928.643	587.22	584.75	6.0	11.0	11.0	NM	NM	11.00	573.75	1998	OVB	5.0	2.0
MW601		15019196.31	1333121.302	586.72	584.29	9.0	19.0	20.0	NM	NM	19.60	564.69	1998	OVB	10.0	2.0
MW602		15019432.73	1332663.469	583.83	581.22	21.0	31.0	31.0	NM	NM	12.00	569.20	1999	BRK	10.0	4.0
MW603		15019323.75	1332379.579	580.77	578.27	6.0	16.0	16.0	NM	NM	13.00	565.30	1999	OVB	10.0	4.0
MW604		15019335.87	1332379.437	581.12	578.27	20.0	30.0	31.0	NM	NM	13.00	565.30	1999	BRK	10.0	4.0

General Notes

Water levels measured between April 10 and 13, 2012.

Coordinates are Universal Transverse Mercator (UTM), Zone 16 East, North American Datum 1983 (NAD83)

UNKOWN = indicate data not presented on borelogs or provided in RI/FS documentation.

NM = Not Applicable, water levels not measured.

BRK = Bedrock

OVB = Overburden

COMBO = Combination Overburden and Bedrock Well

MSL = Feet relative to mean seal level

BGS = Feet below ground surface

ID = identification

TOC = Top of Casing

Surface Water Elevations 2012 Semi-Annual Groundwater Monitoring Report **Joliet Army Ammunition Plant** Will County, Illinois

	Surface Water	Surface Wat	ter Elevation
Site	Location	Date	ft (MSL)
L1	SW550	4/10/2012	603.85
L3	SW557	4/10/2012	587.96
	SW558	4/10/2012	595.56
	SW777	4/10/2012	588.07 ⁽¹⁾
	SW004	4/10/2012	589.43
M1	SW709	4/13/2012	532.71

General Note:

MSL = Mean Sea Level

Footnote:

(1) Surface water elevation not used in production of water table map due to elevation measured being higher than upstream location.

Table 3-1

Summary of Analytical Results - Explosives 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

	ı	C1	1.2 DAID	2.4 DNT	2 C DATE	2 4 4 C DATE	4 4 2 C DNIT	HMX	N/D	2 NITE	2 NUE	4 NUT	DDV	TD-41	1.2.5 TNID	2.4.6 TENTE
		Compound Units	1,3-DNB μg/L	2,4-DNT μg/L	2,6-DNT μg/L	2-A-4,6-DNT μg/L	4-A-2,6-DNT μg/L	HMX μg/L	NB μg/L	2-NT μg/L	3-NT μg/L	4-NT μg/L	RDX μg/L	Tetryl μg/L	1,3,5-TNB μg/L	2,4,6-TNT μg/L
	D 1 1 1									- ' · ·		, ,	μg/L 2.6	μg/L 200	, ,	, ,
	Project Ac	e Water RG	10	0.42 330	0.42 150	NS NS	NS NS	5100 260	51 8000	5100 62	NS NS	NS NS	500	700	5.1 15	9.5 75
Site	Well	Date	•		Result LF/VF											
L1	***************************************	Dau	Result L17 VI	Result Li / VI	Result E17 VI	Result Dr / vr	Result EF7 VF		Plume	Result EF/ VF	Result LT/VI	Result LE7 VI	Result LT/ VI	Result EF/VF	Result Lii / VI	Result EF/VF
121	MW131	4/12/2012	5.4 / J	<3.1	<3.1	65	70	<3.1	<1.6	<3.1	<3.1	<3.1	<1.6	<3.9	<1.6	2200
	WES1	4/12/2012	<1.6	<3.1	<3.1	13	21 / J	<3.1	3.9	<3.1	<3.1	<3.1	<1.6	<3.9	40 / J	38
	MW173	4/11/2012	< 0.16	< 0.31	<0.31	4.8	5.4	1.4 / J	< 0.16	<0.31	<0.31	<0.31	10	<0.39	<0.16	12
									Warning							
	MW174	4/11/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	<0.16	<0.31	<0.31	<0.31	<0.16	<0.39	< 0.16	<0.16
	WES3	4/11/2012	< 0.16	< 0.31	< 0.31	0.67	1	< 0.31	< 0.16	< 0.31	< 0.31	< 0.31	0.74	< 0.39	0.2	1.2
								Com	pliance							
	SW550	4/12/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.16	< 0.31	< 0.31	< 0.31	< 0.16	< 0.39	< 0.16	< 0.16
L3								Upg	radient							
	SW004	4/12/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.16	< 0.31	< 0.31	< 0.31	< 0.16	< 0.39	< 0.16	< 0.16
								In-Plume/I	Downgradient							
	MW410	4/11/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.16	< 0.31	< 0.31	< 0.31	< 0.16	< 0.39	< 0.16	< 0.16
	MW412	4/11/2012	< 0.16	< 0.31	< 0.31	0.89	1.7	28 / J	0.24	< 0.31	< 0.31	< 0.31	120	< 0.39	0.11 F/J	< 0.16
								Early Warnin	g/Downgradien	t						
	MW630	4/11/2012	< 0.16	< 0.31	< 0.31	0.077 F/J	0.18 F/J	4.7 / J	< 0.16	< 0.31	< 0.31	< 0.31	8.7	< 0.39	< 0.16	< 0.16
	MW630(DUP)	4/11/2012	< 0.16	< 0.31	< 0.31	0.072 F/J	0.15 F/J	4.7 / J	< 0.16	< 0.31	< 0.31	< 0.31	8.7	< 0.39	< 0.16	< 0.16
	MW631	4/11/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.16	< 0.31	< 0.31	< 0.31	< 0.16	< 0.39	< 0.16	< 0.16
	MW633	4/11/2012	< 0.16	< 0.31	<0.31	< 0.31	< 0.31	2 / J	<0.16	<0.31	<0.31	< 0.31	6.7	<0.39	<0.16	<0.16
									Downgradient	1	ı	1	1	1		
	SW777	4/11/2012	<0.16	<0.31	<0.31	<0.31	<0.31	<0.31	<0.16	<0.31	<0.31	<0.31	0.25	<0.39	<0.16	<0.16
					l				gradient	T	I		l	l		1
	SW557	4/10/2012	<0.16	<0.31	<0.31	<0.31	<0.31	1.1 / J	<0.16	<0.31	<0.31	<0.31	3.2	<0.39	<0.16	<0.16
100	SW558	4/10/2012	<0.16	<0.31	<0.31	<0.31	<0.31	<0.31	<0.16	<0.31	<0.31	<0.31	<0.16	<0.39	<0.16	<0.16
MFG) 457/0 1 OD	4/15/2012	11 5/	620	260	-4 (7			Plume 1.9	4100	I	2100	1	1	1.	39
(M6)	MW212R MW652	4/15/2012 4/14/2012	1.1 F/ 9.5 F/	620 8400	3300	64 / J 360	51 / J 380 / J	<3.1		4100 44000	<3.1	2100 28000	<1.6	<3.9 <39	<1.6	1600
	MW652 MW652(DUP)	4/14/2012	9.5 F/ 7.9 F/	6800	2700	320	380 / J 320 / J	<31	<16 <16	35000	<31	28000 / J	<16 <16	<39	<16 <16	1300
(M6)	MW032(DUF)	4/14/2012	7.9 Г/	0000	2100	320	320 / J		Warning	35000	\ \S1	22000 / J	<10	<39	<10	1300
(IVIO)	MW123R	4/14/2012	<0.16	<0.31	<0.31	<0.31	<0.31	<0.31	<0.16	<0.31	<0.31	<0.31	<0.16	<0.39	<0.16	<0.16
	MW123R(DUP)	4/14/2012	<0.16	<0.31	<0.31	<0.31	<0.31	<0.31	<0.16	<0.31	<0.31	<0.31	<0.16	<0.39	<0.16	<0.16
	MW162R	4/14/2012	<0.16	0.27 F/J	0.14 F/	<0.31	<0.31	<0.31	<0.16	0.7	<0.31	<0.31	<0.16	<0.39	<0.16	<0.16
	MW313	4/15/2012	<0.16	<0.31	<0.31	<0.31	<0.31	<0.31	<0.16	<0.31	<0.31	<0.31	<0.16	<0.39	<0.16	<0.16
	MW318	4/14/2012	<0.32	0.21 F/J	0.45 F/J	<0.62	<0.62	<0.62	<0.32	< 0.62	< 0.62	<0.62	<0.32	<0.78	<0.32	<0.32
	MW319	4/14/2012	<0.32	<0.62	<0.62	<0.62	<0.62	<0.62	<0.32	<0.62	<0.62	<0.62	<0.32	<0.78	<0.32	0.29 F/J
	MW654	4/15/2012	<0.16	1.7	0.97	0.7	2.2	<0.31	< 0.16	18	0.23 F/J	11	0.31 / J	<0.39	<0.16	0.18 / J
(M7)	MW124R	4/14/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.16	< 0.31	< 0.31	< 0.31	< 0.16	< 0.39	< 0.16	< 0.16
(M6)								Com	pliance							
(Other Areas)	MW117	4/13/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.16	<0.31 U/UJ	< 0.31	< 0.31	< 0.16	< 0.39	< 0.16	< 0.16
	MW118	4/13/2012	<0.16	< 0.31	<0.31	<0.31	<0.31	< 0.31	<0.16	<0.31 U/UJ	<0.31	< 0.31	< 0.16	< 0.39	<0.16	< 0.16
	MW119	4/13/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.16	<0.31 U/UJ	< 0.31	< 0.31	< 0.16	< 0.39	< 0.16	< 0.16

Table 3-1

Summary of Analytical Results - Explosives 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

		Compound	1,3-DNB	2,4-DNT	2,6-DNT	2-A-4,6-DNT	4-A-2,6-DNT	HMX	NB	2-NT	3-NT	4-NT	RDX	Tetryl	1,3,5-TNB	2,4,6-TNT
		Units	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L
	Project Ac	tion Limit ⁽¹⁾	10	0.42	0.42	NS	NS	5100	51	5100	NS	NS	2.6	200	5.1	9.5
		e Water RG	4	330	150	NS	NS	260	8000	62	NS	NS	500	700	15	75
Site	Well	Date	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF
M11								Upg	radient							
	MW802	4/16/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.16	< 0.31	< 0.31	< 0.31	< 0.16	< 0.39	< 0.16	<0.16 U/UJ
								Down	gradient							
	MW335	4/16/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.16	< 0.31	< 0.31	< 0.31	< 0.16	< 0.39	< 0.16	<0.16 U/UJ
	MW336	4/16/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.16	< 0.31	< 0.31	< 0.31	< 0.16	< 0.39	< 0.16	<0.16 U/UJ
	MW805	4/16/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.16	< 0.31	< 0.31	< 0.31	< 0.16	< 0.39	< 0.16	<0.16 U/UJ
M13									radient							
	MW806	2/29/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.16	< 0.31	< 0.31	< 0.31	< 0.16	< 0.39	< 0.16	< 0.16
	MW806	4/16/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.16	< 0.31	< 0.31	< 0.31	< 0.16	< 0.39	< 0.16	< 0.16
	MW807	2/29/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.16	< 0.31	< 0.31	< 0.31	< 0.16	< 0.39	< 0.16	< 0.16
	MW807	4/16/2012	< 0.16	< 0.31	< 0.31	< 0.31	<0.31	<0.31	<0.16	<0.31	<0.31	< 0.31	< 0.16	<0.39	<0.16	<0.16 U/UJ
									gradient	1	T					
	AEHA14R	3/1/2012	< 0.16	< 0.31	< 0.31	0.79	1.1	<0.31	< 0.16	<0.31	<0.31	< 0.31	<0.16	<0.39	<0.16	<0.16
	AEHA15	3/1/2012	< 0.16	< 0.31	< 0.31	< 0.31	<0.31	<0.31	<0.16	<0.31	<0.31	<0.31	< 0.16	<0.39	<0.16	<0.16
									gradient							
	MW126R	2/29/2012	< 0.16	< 0.31	< 0.31	< 0.31	< 0.31	< 0.31	< 0.16	< 0.31	< 0.31	< 0.31	< 0.16	< 0.39	< 0.16	< 0.16
	MW126R	4/16/2012	< 0.16	<0.31	<0.31	< 0.31	<0.31	<0.31	<0.16	0.35	<0.31	0.3 F/	<0.16	<0.39	<0.16	<0.16
	MW362	2/29/2012	<0.16	1.5	<0.31	0.83	0.78	<0.31	<0.16	<0.31	<0.31	<0.31	<0.16	<0.39	<0.16	<0.16
	MW362	4/16/2012	<0.16	4.9	<0.31	1.2	1.1	<0.31	<0.16	0.24 F/J	<0.31	<0.31 U/UJ	<0.16	<0.39	<0.16	0.073 F/
	MW362(DUP) MW808	4/16/2012 2/29/2012	<0.16	5.4 <0.31	<0.31	1.2 <0.31	<0.31	<0.31	<0.16	<0.31	0.19 F/	1.9 / J <0.31	<0.16	<0.39 <0.39	<0.16	0.077
					<0.31			<0.31			<0.31					<0.16
	MW808 MW809	4/16/2012 2/29/2012	<0.16	<0.31	<0.31	<0.31	<0.31	<0.31	<0.16	<0.31	<0.31	<0.31	<0.16	<0.39	<0.16	<0.16
	MW809(DUP)	2/29/2012	<0.16	<0.31	<0.31	<0.31	<0.31	<0.31	<0.16	<0.31	<0.31	<0.31	<0.16	<0.39	<0.16	<0.16
	MW809(DUP) MW809	4/16/2012	<0.16	<0.31	<0.31	<0.31	<0.31	<0.31	<0.16	<0.31	<0.31	<0.31	<0.16	<0.39	<0.16	<0.16
	IVI VV 0U7	4/10/2012	\0.10	√ 0.31	√ 0.31	\0.31	√ 0.31	√ 0.31	√ 0.10	√ 0.31	√ 0.31	√ 0.31	√ 0.10	\U.39	√ 0.10	\0.10

(1) Project Action Limits (Remedial Goal{RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the Long Term Monitoring Plan (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

Only data collected in 2012 are shown.
<= Result shows laboratory Method Reporting Limit for non-detected results

μg/L = microgram per liter 1,3,5-TNB = 1,3,5-Trinitrobenzene 1,3-DNB = 1,3-Dinitrobenzene

2,4,6-TNT = 2,4,6-Trinitrotoluene 2,4-DNT = 2,4-Dinitrotoluene 2,6-DNT = 2,6-Dinitrotoluene

2-A-4,6-DNT = 2-amino-4,6-Dinitrotoluene

2-NT = 2-Nitrotoluene
3-NT = 3 Nitrotoluene
4-A-2,6-DNT = 4-amino-2,6-Dinitrotoluene

4-NT = 4-Nitrotoluene

Bolded result indicates Project Action Limit (RG) exceedance DUP = duplicate $F = Concentration below the reported detection limit \\ HMX = High melting explosive$

J = Estimated concentration LF/VF = Lab Flag/Validation Flag

NB = Nitrobenzene

NJ = presumptive evidence that compound concentration is estimated
NS = No standard
RDX = Royal demolition explosive

U = Not detected UJ = Not detected, estimated detection limit

Table 3-2

Summary of Analytical Results - Target Analyte List Metals 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

		Analyte	Aluminum	Antimony	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Nickel	Potassium	Silver	Sodium	Vanadium	Zinc
		Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Project Ac	ction Limit ⁽¹⁾	100	0.024	0.2	NS	0.05	NS	1.0	NS	NS	5.0	0.1	NS	10	NS	NS	NS	0.511	NS	NS	10
		e Water RG	NS	0.61	0.16	5	0.0023	NS	0.44	NS	0.026	1.0	0.064	NS	1.0	0.103	1.0	NS	0.005	NS	NS	1.0
Site	Well			Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF				F Result LF/VF	Result LF/VF			Result LF/VF		Result LF/VF		Result LF/VF		Result LF/VI	Result LF/VF
L3												gradient										
	SW004	4/10/2012	<0.20	<0.020	<0.010	0.039	0.0009 F/	73	< 0.010	<0.0050	0.018 / U	<0.20	< 0.0050	38	0.09	< 0.20	< 0.010	1.4	<0.0050	15	<0.0050	<0.020
											In-Plume	Downgradient										
	MW412	4/11/2012	<0.20	<0.020	< 0.010	0.042	0.0011 F/	96	< 0.010	<0.0050	0.026 / U	<0.20	<0.0050	51	< 0.010	< 0.20	< 0.010	1	< 0.0050	7.7	<0.0050	< 0.020
											Early Warni	ng/Downgradie	nt									
	MW630	4/11/2012	<0.20	<0.020	< 0.010	0.011	0.00078 F/	83	< 0.010	< 0.0050	0.027 / U	<0.20	< 0.0050	43	0.033	< 0.20	< 0.010	4.4	<0.0050	22	< 0.0050	0.0087 F/
	MW630(DUP)		< 0.20	< 0.020	< 0.010	0.011	0.00087 F/	84	< 0.010	< 0.0050	0.02 / U	< 0.20	< 0.0050	44	0.032	< 0.20	< 0.010	4.4	< 0.0050	22	< 0.0050	< 0.020
	MW631		< 0.20	< 0.020	< 0.010	0.017	0.00082 F/	67	< 0.010	< 0.0050	0.015 / U	< 0.20	< 0.0050	36	0.022	< 0.20	< 0.010	4.9	< 0.0050	28	< 0.0050	< 0.020
	MW633	4/11/2012	< 0.20	< 0.020	< 0.010	0.047	0.00079 F/	83	< 0.010	< 0.0050	0.023 / U	< 0.20	< 0.0050	37	< 0.010	< 0.20	< 0.010	1	< 0.0050	5.7	< 0.0050	< 0.020
											Compliance	e/Downgradien	ut.									
	SW777	4/11/2012	< 0.20	< 0.020	< 0.010	0.039	0.00087 F/	73	< 0.010	< 0.0050	0.0041 F/U	< 0.20	< 0.0050	39	0.06	< 0.20	< 0.010	1.4	< 0.0050	14	< 0.0050	0.0087 F/
											Dow	ngradient										
	SW557	4/10/2012	< 0.20	< 0.020	< 0.010	0.039	0.00085 F/	75	< 0.010	< 0.0050	0.023 / U	< 0.20	< 0.0050	39	0.072	< 0.20	< 0.010	1.4	< 0.0050	15	< 0.0050	< 0.020
	SW558	4/10/2012	< 0.20	< 0.020	< 0.010	0.042	0.00079 F/	80	< 0.010	< 0.0050	0.0066 F/U	< 0.20	< 0.0050	43	0.0027 F/	< 0.20	< 0.010	1	< 0.0050	6.2	< 0.0050	< 0.020
M11											Up	gradient										
	MW802	4/16/2012	< 0.20	< 0.020	< 0.010	0.026	< 0.0020	75	< 0.010	< 0.0050	0.0012 F/	< 0.20	< 0.0050	34	0.75	< 0.20	0.0023 F/	2	< 0.0050	19	0.0025 F/	0.0078 F/
											Dow	ngradient										
	MW335	4/16/2012	< 0.20	< 0.020	< 0.010	0.021	< 0.0020	210	< 0.010	< 0.0050	0.0051 F/	< 0.20	< 0.0050	140	< 0.010	< 0.20	0.0024 F/	6.4	< 0.0050	48	0.0047 F/	0.0047 F/
	MW336		< 0.20	< 0.020	< 0.010	0.02	< 0.0020	120	< 0.010	< 0.0050	0.0011 F/	0.15 F/	< 0.0050	80	0.033	< 0.20	< 0.010	4.1	< 0.0050	56	0.004 F/	0.0069 F/
	MW805	4/16/2012	< 0.20	< 0.020	< 0.010	0.028	< 0.0020	110	< 0.010	< 0.0050	0.0016 F/	< 0.20	< 0.0050	75	< 0.010	< 0.20	0.0059 F/	9.5	< 0.0050	97	0.0037 F/	0.0078 F/
M13											Up;	gradient										
	MW806	2/29/2012	< 0.20	< 0.020	< 0.010	0.096	< 0.0020	76	0.001 F/	< 0.0050	< 0.010	< 0.20	< 0.0050	46	0.0017 F/	< 0.20	< 0.010	2.1 / J	< 0.0050	24	0.0031 F/	< 0.020
	MW806	.,,	< 0.20	< 0.020	< 0.010	0.082	0.00068 F/	68	< 0.010	< 0.0050	< 0.010	< 0.20	< 0.0050	40 / J	0.0024 F/	<0.20 U/UJ	< 0.010	1.6	< 0.0050	22 / J	< 0.0050	0.013 F/
	MW807		0.026 F/	0.003 F/U	< 0.010	0.097	< 0.0020	180	< 0.010	< 0.0050	< 0.010	0.82	0.0017 F/U	89	0.092	< 0.20	0.0021 F/	14 / J	< 0.0050	400	0.004 F/	< 0.020
	MW807	4/16/2012	< 0.20	< 0.020	< 0.010	0.088	0.00098 F/	160	< 0.010	< 0.0050	< 0.010	0.59	< 0.0050	79 / J	0.11	<0.20 U/UJ	0.0025 F/	7.2	< 0.0050	380 / J	< 0.0050	0.0095 F/
												ngradient										
	AEHA14R		0.027 F/	< 0.020	< 0.010	0.089	< 0.0020	110	< 0.010	< 0.0050	0.0012 F/	< 0.20	< 0.0050		0.0019 F/	< 0.20	< 0.010	12	< 0.0050	50	0.0029 F/	< 0.020
	AEHA15		5.7	<0.020	0.0076 F/	0.1	< 0.0020	140	0.0088 F/	0.0066	0.013	15	0.012	77	0.54	<0.20	0.013	4.6	< 0.0050	20	0.014	0.029
	MW126R		<0.20	<0.020	<0.010	0.055	<0.0020	67	<0.010	<0.0050	<0.010	<0.20	0.0016 F/U	43	0.0088 F/	<0.20	<0.010	2.4 / J	<0.0050	26	0.0029 F/	<0.020
	MW126R		<0.20 <0.20	<0.020 0.0035 F/U	<0.010 <0.010	0.048	0.00078 F / <0.0020	61	<0.010	<0.0050 0.0011 F/	<0.010 <0.010	<0.20 <0.20	<0.0050	39 / J	0.0032 F/	<0.20 U/UJ <0.20	0.0022 F/ 0.0044 F/	2 8.5 / J	<0.0050 <0.0050	25 / J	<0.0050	0.009 F/ <0.020
	MW362 MW362		0.034 F/	<0.020	<0.010	0.044 0.041	0.0020 0.00098 F/	160 150	0.001 F/ <0.010	<0.0011 F /	<0.010	<0.20 0.14 F/	0.0016 F/U <0.0050	100 89 / J	0.043 0.078	<0.20 <0.20 U / UJ	0.0044 F/ 0.0042 F/	8.5 / J 5.8	<0.0050	180 200 / J	0.0047 F / <0.0050	<0.020
	MW362(DUP)		<0.20	<0.020	<0.010	0.041	0.00098 F/	150	<0.010	<0.0050	<0.010	0.14 F/	<0.0050	93 / J	0.078	<0.20 U/UJ	0.0042 F/	6	<0.0050	210 / J	<0.0050	0.020 0.011 F/
	MW808		<0.20	0.0033 F/U	<0.010	0.16	<0.001	120	<0.010	0.0082	<0.010	1.7	<0.0050	67	0.55	<0.20	0.0003	11 / J	<0.0050	61	0.0030 F /	0.011 F/
	MW808		<0.20	<0.020	<0.010	0.14	0.0020 0.00081 F/	100	<0.010	0.016	0.0010 F/	2.6	<0.0050	59 / J	0.89	<0.20 U / UJ	0.026	8.3	<0.0050	56 / J	<0.0050	0.0069 F/
	MW809		<0.20	0.0028 F/U	< 0.010	0.031	<0.0020	41	< 0.010	< 0.0050	<0.010	<0.20	<0.0050	31	0.0055 F/	<0.20	< 0.010	2.6 / J	<0.0050	19	0.0022 F/	<0.020
	MW809(DUP)		<0.20	0.0031 F/U	< 0.010	0.031	<0.0020	40	< 0.010	< 0.0050	< 0.010	<0.20	0.0016 F/U	31	0.0059 F/	<0.20	< 0.010	2.6 / J	< 0.0050	19	0.0024 F/	< 0.020
	MW809	4/16/2012	0.028 F/	< 0.020	< 0.010	0.028	0.00065 F/	38	< 0.010	< 0.0050	< 0.010	0.094 F/	< 0.0050	29 / J	0.0024 F/	<0.20 U/UJ	0.0044 F/	2.4	< 0.0050	19 / J	< 0.0050	0.0073 F/

Footnotes:

(1) Project Action Limits (Remedial Goal {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the Long Term Monitoring Plan (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

An abbreviated list of analytes is used for reporting based on historically detected and reported compounds.

< = Result shows laboratory Method Reporting Limit for non-detected results

Bolded result indicates Project Action Limit (RG) exceedance

DUP = duplicate

F = Concentration below the reported detection limit

J = Estimated concentration

LF/VF = Lab Flag/Validation Flag

mg/L = milligrams per liter

NS = No standard U = Not detected

UJ = Not detected, estimated detection limit

Table 3-3

Summary of Analytical Results - Indicator Parameters 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

		Compound	Nit	rate	Sulf	fate
		Units		g/L	mg	
	Project Act	tion Limit ⁽¹⁾	,	0	4(
		Water RG		IS	N	
Site	Well	Date		LF/VF		LF/VF
M1	-	000000000000000000000000000000000000000	-Plume			
	MW107	4/12/2012	NA		26,000	
	MW231	4/12/2012	NA		35,000	
	MW640	4/12/2012	NA		5,200	
	MW641	4/12/2012	NA		640	
	MW641(DUP)	4/12/2012	NA		640	
	MW642	4/12/2012	NA		420	
	MW642(DUP)	4/12/2012	NA		420	
	1V1 VV U42(DUF)		Warnin		720	
	MW643	4/13/2012	NA	' 5	58	
	MW644	4/13/2012	NA		160	
	1V1 VY U4-4		npliance	•	100	
	MW-45			2	67	
	MW645	4/13/2012	NA NA		67	
	MW646	4/13/2012	NA NA		110	
	MW648	4/12/2012	NA		34	
	MW649	4/13/2012	NA		64	
	SW709	4/13/2012	NA		60	
MFG) #HY2000		-Plume		400	
(M9)	MW330	4/17/2012	NA		430	
M11	Mariona		gradient		0.5	
	MW802	4/16/2012	0.11		85	
	MW225		ngradien	u	66A	
	MW335	4/16/2012	0.31		660	
	MW336	4/16/2012	0.12		410	
N/12	MW805	4/16/2012	0.22		4/0	
M13	MWOOC		gradient		70	
	MW806	2/29/2012	0.39	/ T	79	
	MW806	4/16/2012	0.39	/ J	80	
	MW807	2/29/2012 4/16/2012	<1.0	11/111	230	
	MW807		<1.0 ngradien	U / UJ	230	
	AEHA14R	3/1/2012	ngraaien 1.7	•	140	
	AEHA14K AEHA15	3/1/2012	0.13		12	
	MW126R	2/29/2012	0.13		53	
	MW126R MW126R	4/16/2012	0.12		52	
	MW362	2/29/2012	<1.0		280	
	MW362 MW362	4/16/2012	<1.0		270	
	MW362(DUP)	4/16/2012	<1.0	U / UJ	270	
	MW808	2/29/2012	<0.10	3 / 33	99	
	MW808	4/16/2012	<0.10		88	
	MW809	2/29/2012	<0.10		5.9	
	MW809(DUP)	2/29/2012	<0.10		5.9	
	MW809	4/16/2012	0.13	/ J	5.4	
	111 11 007	1/10/2012	0.13	/ 3	5.7	

Footnotes:

(1) Project Action Limits (Remedial Goal {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the Long Term Monitoring Plan (Toltest 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

 $mg/L = milligrams \ per \ liter$

< = Result shows laboratory Method Reporting Limit for non-detected results Bolded result indicates Project Action Limit (RG) exceedance

DUP = duplicate

 $F = Concentration \ below \ the \ reported \ detection \ limit$

J = Estimated concentration

LF/VF = Lab Flag/Validation Flag

 $NA = not \ analyzed$

NS = No standard

R = Rejected data, unusable

U = Not detected

UJ = Not detected, estimated detection limit

Table 3-4

Summary of Analytical Results - Volatile Organic Compounds 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

		Compound	Acetone	Benzene	Carbon disulfide	Chlorobenzene	Chloror	nethane	1,1-DCA	1,2-DCA	cis-1,2-DCE	Ethyl Benzene	MethCl	MEK	Naphthalene	PCE	Toluene	1,1,1-TCA	TCE	VC	Xylenes (total)
		Units	μg/L	μg/L	μg/L	μg/L	με	/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L
	Project Act	tion Limit(1)	NS	25	NS	500	N	S	3500	25	200	1,000	NS	NS	NS	25	2,500	1,000	25	25	10,000
Site	Well	Date	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result	LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF
M11											Upgra	adient									
	MW802	4/16/2012	< 5.0	<1.0	< 5.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<3.0	< 5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
											Downg	radient									
	MW335	4/16/2012	< 5.0	<1.0	< 5.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<3.0	< 5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	MW336	4/16/2012	<5.0	<1.0	<5.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<3.0	< 5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	MW805	4/16/2012	<5.0	<1.0	< 5.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<3.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
M13				_						_	Upgr	adient									
	MW806	2/29/2012	<5.0	<1.0	<5.0	<1.0	<1.0	U / UJ	<1.0	<1.0	<1.0	<1.0	<3.0	<5.0 U / UJ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	MW806	4/16/2012	<5.0	<1.0	<5.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<3.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	MW807	2/29/2012	<5.0	<1.0	2.4 F/	<1.0	<1.0	U / UJ	1.4	<1.0	0.79 F/	<1.0	<3.0	<5.0 U/UJ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	MW807	4/16/2012	<5.0	<1.0	<5.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<3.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
											Downg	radient							1		
	AEHA14R	3/1/2012	<5.0	<1.0	< 5.0	<1.0	<1.0	U / UJ	<1.0	<1.0	<1.0	<1.0	<3.0	<5.0	<1.0	<1.0	<1.0	<1.0 U/UJ	<1.0	<1.0	<1.0
	AEHA15	3/1/2012	<5.0	<1.0	< 5.0	<1.0	<1.0	U / UJ	<1.0	<1.0	<1.0	<1.0	<3.0	<5.0	<1.0	<1.0	<1.0	<1.0 U/UJ	<1.0	<1.0	<1.0
	MW126R	2/29/2012	<5.0	<1.0	< 5.0	<1.0	<1.0	U / UJ	<1.0	<1.0	<1.0	<1.0	<3.0	<5.0 U/UJ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	MW126R	4/16/2012	<5.0	<1.0	< 5.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<3.0	<5.0	<1.0	<1.0	<1.0	<1.0	0.23 F/	<1.0	<1.0
	MW362	2/29/2012	<5.0	<1.0	<5.0	<1.0	<1.0	U / UJ	<1.0	<1.0	<1.0	<1.0	<3.0	<5.0 U/UJ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	MW362	4/16/2012	<5.0	<1.0	<5.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<3.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	MW362(DUP)	4/16/2012	<5.0	<1.0	<5.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<3.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
			T	T	T	T				T		radient		T		T	T	T	T	T	T
	MW808	2/29/2012	<5.0	<1.0	<5.0	<1.0	<1.0	U / UJ	<1.0	<1.0	<1.0	<1.0	<3.0	<5.0 U/UJ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1 -	MW808	4/16/2012	<5.0	<1.0	<5.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<3.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	MW809	2/29/2012	<5.0	<1.0	<5.0	<1.0	<1.0	U / UJ	<1.0	<1.0	<1.0	<1.0	<3.0	<5.0 U/UJ	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	MW809(DUP)	2/29/2012	<5.0	<1.0	<5.0	<1.0	<1.0	U / UJ	<1.0	<1.0	<1.0	<1.0	<3.0	<5.0 U/UJ		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	MW809	4/16/2012	<5.0	<1.0	< 5.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<3.0	< 5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

(1) Project Action Limits (Remedial Goal {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the Long Term Monitoring Plan (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

An abbreviated list of compounds is used for reporting based on historically detected and reported compounds. μ g/L = micrograms per liter

< = Result shows laboratory method reporting limit for non-detected results

1,1,1-TCA = 1,1,1-Trichloroethane

1,1-DCA = 1,1-Dichloroethane

1,2-DCA = 1,2-Dichloroethane

Bolded result indicates Project Action Limit (RG) exceedance

cis-1,2-DCE = cis-1,2-Dichloroethene

DUP = duplicate

F = Concentration below the reported detection limit

LF/VF = Lab Flag/Validation Flag MEK = Methyl Ethyl Ketone (2-butanone)

MethCl = Methylene Chloride

NS = No standard PCE = Tetrachloroethene TCE = Trichloroethene

U = Not detected

UJ = Not detected, estimated detection limit

VC = Vinyl chloride

Table 3-5

Summary of Analytical Results - Semivolatile Organic Compounds 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

		Compound	2,4-DNT	2,6-DNT	Naphthalene	NB	2-Methylnaphthalene	Phenol
		Units	μg/L	μg/L	μg/L	μg/L	μg/L	μg/L
	Project A	ction Limit ⁽¹⁾	0.42	0.42	NS	51	NS	NS
Site	Well	Date	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF	Result LF/VF
M11				Up	gradient			
	MW802	4/16/2012	<1.3	< 0.47	< 0.93	< 0.93	<0.47 U / UJ	<4.7
				Don	vngradient			
	MW335	4/16/2012	<1.3	< 0.47	< 0.93	< 0.93	<0.47 U / UJ	<4.7
	MW336	4/16/2012	<1.3	< 0.47	< 0.93	< 0.93	< 0.47	<4.7
	MW805	4/16/2012	<1.3	< 0.47	< 0.93	< 0.93	<0.47 U / UJ	<4.7
M13				Up	gradient			
	MW806	2/29/2012	<1.3	< 0.47	< 0.93	< 0.93	<0.47 U / UJ	<4.7
	MW806	4/16/2012	<1.3	< 0.47	< 0.93	< 0.93	<0.47 U / UJ	<4.7
	MW807	2/29/2012	<1.3	< 0.47	< 0.93	< 0.93	<0.47 U / UJ	<4.7
	MW807	4/16/2012	<1.3	< 0.47	< 0.93	< 0.93	<0.47 U / UJ	<4.7
				Don	ngradient			
	AEHA14R	3/1/2012	<1.3 U / UJ	<0.47 U/UJ	< 0.93 U/UJ	< 0.93 U / UJ	<0.47 U / UJ	<4.7 U / UJ
	AEHA15	3/1/2012	<1.5	< 0.53	<1.1	<1.1	<0.53 U / UJ	<5.3
	MW126R	2/29/2012	<1.3	< 0.48	< 0.95	< 0.95	<0.48 U / UJ	<4.8
	MW126R	4/16/2012	<1.3	< 0.47	< 0.93	< 0.93	<0.47 U / UJ	<4.7
	MW362	2/29/2012	<1.3	< 0.47	< 0.93	< 0.93	<0.47 U / UJ	<4.7
	MW362	4/16/2012	3.3	0.25 F/	< 0.93	< 0.93	<0.47 U / UJ	<4.7
	MW362(DUP)	4/16/2012	2.6	0.29 F/	< 0.93	< 0.93	<0.47 U / UJ	<4.7
				Don	ngradient			
	MW808	2/29/2012	<1.3	< 0.47	< 0.93	< 0.93	<0.47 U / UJ	<4.7
	MW808	4/16/2012	<1.3	< 0.47	< 0.93	<0.93	<0.47 U / UJ	<4.7
	MW809	2/29/2012	<1.3	<0.47	<0.93	<0.93	<0.47 U / UJ	<4.7
	MW809(DUP)	2/29/2012	<1.3	<0.47	<0.93	<0.93	<0.47 U / UJ	<4.7
	MW809	4/16/2012	<1.3	< 0.47	< 0.93	< 0.93	<0.47 U / UJ	<4.7

Footnotes:

(1) Project Action Limits (Remedial Goal {RG}) obtained from Worksheet #15 of Appendix B (QAPP) of the Long Term Monitoring Plan (Toltest, 2010). IEPA Class II groundwater standards for industrial uses are presented where Class I and Class II standards (potable and industrial uses, respectively) were both available.

General Notes:

An abbreviated list of compounds analyzed is used for reporting based on historically detected and reported compounds.

< = Result shows laboratory method reporting limit for non-detected results

 $\mu g/L = micrograms \ per \ liter$

2,4-DNT = 2,4-dinitrotoluene

2,6-DNT = 2,6-dinitrotoluene

Bolded result indicates Project Action Limit (RG) exceedance

DUP = duplicate

F = Concentration below the reported detection limit

 $LF/VF = Lab\ Flag/Validation\ Flag$

NB = nitrobenzene

NS = No standard

R = Rejected data, unusable

U = Not detected

UJ = Not detected, estimated detection limit

Table 3-6

Groundwater Horizontal Gradients 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

		February 2	012					April 2012		
	Well Number	Well Number				Well Number	Well Number			
	Groundwater	Groundwater	Head	Horizontal	Horizontal	Groundwater	Groundwater	Head	Horizontal	Horizontal
Site	Elevation (ft MSL)	Elevation (ft MSL)	Difference (ft)	Separation (ft)	Gradient	Elevation (ft MSL)	Elevation (ft MSL)	Difference (ft)	Separation (ft)	Gradient
LAP AREA										
L1	MW176	MW173			L1 (North)	MW176	MW173			L1 (North)
	NM	NM	NM	1620	NM	622.35	603.31	19.04	1620	0.0118
	MW611	MW610			L1 (South)	MW611	MW610			L1 (South)
	NM	NM	NM	400	NM	606.44	601.41	5.03	400	0.0126
L3/	MW1	MW410				MW1	MW410			
Landfill L3	NM	NM	NM	780	NM	613.86	592.32	21.54	780	0.0276
MFG AREA										
M1	MW107	MW643				MW107	MW643			
	NM	NM	NM	430	NM	546.34	533.30	13.04	430	0.0303
M6	MW650	MW165			M6 (North)	MW650	MW165			(North)
	NM	NM	NM	930	NM	555.61	538.21	17.40	930	0.0187
	MW309	MW160			M6 (South)	MW309	MW160			(South)
	NM	NM	NM	840	NM	554.33	535.46	18.87	840	0.0225
M7	MW307	MW216				MW307	MW216			
	NM	NM	NM	1200	NM	544.01	531.43	12.58	1200	0.0105
Landfill M13	AEHA14R	MW126R				AEHA14R	MW126R			
	551.97	546.38	5.59	1160	0.0048	551.90	546.46	5.44	1160	0.0047
Landfill M11	MW802	MW804	·	·		MW802	MW804			
	NM	NM	NM	1030	NM	536.73	531.41	5.32	1030	0.0052

General Notes:

ft = feet

MSL = mean sea level

NM = Not Applicable, water levels not measured.

Table 3-7

Groundwater Flow Velocities 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

		February	April		Febr	uary	Ap	oril
Site	Average K (cm/sec)	Horizontal Gradient	Horizontal Gradient	Effective Porosity	Velocity (cm/sec)	Velocity (ft/day)	Velocity (cm/sec)	Velocity (ft/day)
L1 ⁽¹⁾	9.2E-06	NM	0.0122	0.3	NM	NM	0.0000	0.0011
L3/Landfill L3 ⁽²⁾	1.6E-03	NM	0.0276	0.3	NM	NM	0.0001	0.4172
M1	6.6E-05	NM	0.0303	0.3	NM	NM	0.0000	0.0189
MFG (M6) ⁽³⁾	8.6E-04	NM	0.0206	0.3	NM	NM	0.0001	0.1674
MFG (M7)	6.7E-04	NM	0.0105	0.3	NM	NM	0.0000	0.0665
MFG (Landfill M13)	8.0E-02	0.0048	0.0047	0.3	0.0013	3.6274	0.0013	3.5518
Average for MFG Sites								
M6, M7, and M13	2.7E-02	NM	0.0119	0.3	NM	NM	0.0004	1.2619
Landfill M11 ⁽⁴⁾	6.7E-04	NM	0.0052	0.3	NM	NM	0.00001	0.0329

General Notes:

Hydraulic conductivity values are averages for the overburden aquifer.

Horizontal gradients are calculated using water table elevation data.

K = Hydraulic Conductivity

NM = Water levels not measured.

MFG = Manufacturing Area Sites.

cm/sec = centimeters per second

ft = feet

Foornotes:

- (1) Average of north and south gradients at L1 used for April measurements.
- (2) No hydraulic conductivity data were available for Site L3. Values used are from nearby Site L2.
- (3) Average of north and south gradients at M6 used for April measurements.
- (4) No hydraulic conductivity data were available for Site M11 Landfill. Value used is from nearby Site M7.

Table 3-8

Vertical Gradients 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammuntion Plant Will County, Illinois

Site	Area/Well ID	Ground Elevation (ft MSL)	Depth (ft) to top of screen (from ground)	Depth (ft) to bottom of screen (from ground)	Screen Length (feet)	Elevation of Screen Midpoint (ft MSL)	Groundwater Elevation 2/12 (ft MSL)	Vertical Gradient 2/12 (ft/ft)	Groundwater Elevation 4/12 (ft MSL)	Vertical Gradient 4/12 (ft/ft)
LOAD-ASSEM	IBLE-PACK	AGE AREA								
L1	MW178	640.39	27.3	46.5	19.2	603.49	NM	NM	615.82	-0.3462
	MW176	643.49	4.8	20.8	16.0	630.69	NM		622.35	
	MW172	613.19	14.5	34.5	20.0	588.69	NM	NM	603.35	0.0027
	MW173	612.56	2.8	11.8	9.0	605.26	NM		603.31	
	MW177	613.84	11.8	31.0	19.2	592.44	NM	NM	608.30	0.0538
	MW171	615.03	2.9	7.9	5.0	609.63	NM		607.49	
	MW401	610.2	28.5	43.5	15.0	574.20	NM	NM	601.50	0.0033
	MW610	609.62	4.0	14.0	10.0	600.62	NM		601.41	
L3/	MW631	592.23	16.0	26.0	10.0	571.23	NM	NM	590.33	0.1170
Landfill L3	MW630	592.23	7.0	12.0	5.0	582.73	NM		588.33	
MANUFACTU	RING AREA	L								
M1	MW640	545.4	29.0	39.0	10.0	511.40	NM	NM	544.17	0.0218
	MW351	545.68	9.5	19.5	10.0	531.18	NM		543.47	
	MW642	545.08	29.0	39.0	10.0	511.08	NM	NM	541.72	-0.0179
	MW641	545.08	7.0	17.0	10.0	533.08	NM		542.28	
MFG (M6)	MW312	545.96	40.0	55.0	15.0	498.46	NM	NM	547.55	0.0002
	MW311	546.36	14.0	24.0	10.0	527.36	NM		547.54	
	MW319	545.49	40.0	55.0	15.0	497.99	NM	NM	537.55	-0.0030
	MW318	545.23	11.8	21.8	10.0	528.43	NM		537.67	
	MW313	549.20	25.0	40.0	15.0	516.70	NM	NM	539.04	0.0201
	MW654	548.49	13.0	23.0	10.0	530.49	NM		538.60	
	MW317	540.71	34.0	49.0	15.0	499.21	NM	NM	536.28	-0.0123
	MW316	540.49	13.0	18.0	5.0	524.99	NM		536.74	
	MW310R	563.00	44.5	59.5	15.0	511.00	NM	NM	543.11	-0.2589
	MW309	563.43	12.7	27.7	15.0	543.23	NM		554.33	
	MW315	538.91	29.7	44.7	15.0	501.71	NM	NM	535.41	-0.0003
	MW314	539.53	9.7	14.7	5.0	527.33	NM	1	535.42	1

Table 3-8

Vertical Gradients 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammuntion Plant Will County, Illinois

Site	Area/Well ID	Ground Elevation (ft MSL)	Depth (ft) to top of screen (from ground)	Depth (ft) to bottom of screen (from ground)	Screen Length (feet)	Elevation of Screen Midpoint (ft MSL)	Groundwater Elevation 2/12 (ft MSL)	Vertical Gradient 2/12 (ft/ft)	Groundwater Elevation 4/12 (ft MSL)	Vertical Gradient 4/12 (ft/ft)
MFG (M6)	MW308	561.38	50.5	65.5	15.0	503.38	NM	NM	542.26	-0.0431
	MW307	561.45	17.0	27.0	10.0	539.45	NM		544.01	
MFG (M7)	MW158	531.58	9.0	29.5	20.5	512.33	NM	NM	530.34	0.0000
	MW157	531.37	3.7	10.2	6.5	524.42	NM		530.34	
	MW217	536.90	19.5	34.5	15.0	509.90	NM	NM	531.94	0.0237
	MW216	536.51	5.0	10.0	5.0	529.01	NM		531.43	
								_		
	MW322	542.26	34.5	49.5	15.0	500.26	NM	NM	533.79	-0.1052
	MW321	542.93	13.5	23.5	10.0	524.43	NM		537.73	
	MW661	537.09	20.0	30.0	10.0	512.09	NM	NM	532.82	-0.0486
	MW660	537.08	7.0	12.0	5.0	527.58	NM		533.88	
Landfill M11	MW802	541.62	5.0	15.0	10.0	531.62	NM	NM	536.73	0.1327
	MW803	541.56	26.5	36.5	10.0	510.06	NM		540.27	
	MW804	533.78	5.0	15.0	10.0	523.78	NM	NM	531.41	-0.0115
	MW805	533.62	25.0	35.0	10.0	503.62	NM		531.09	
Landfill M13	MW126R	563.00	11.0	21.0	10.0	547.00	546.38	0.2106	546.46	0.1939
	MW362	562.78	28.0	33.0	5.0	532.28	549.35		549.21	
	MW363	567.66	21.0	31.0	10.0	541.66	542.18	-0.0057	542.13	0.0007
	MW364	567.69	37.0	42.0	5.0	528.19	542.10		542.14	
	MW806	563.73	15.0	25.0	10.0	543.73	551.55	-0.0421	551.44	-0.0463
	MW807	563.79	35.0	45.0	10.0	523.79	550.38		550.16	
	MW808	567.33	15.0	25.0	10.0	547.33	551.85	-0.1131	552.14	-0.1319
	MW809	567.28	35.0	45.0	10.0	527.28	549.07	1	548.86	

Notes:

Water Level in Deep Well - Water Level in Shallow Well ABS (Water Table Elevation - Screen Midpoint of Deep Well)

Vertical Gradient = -----

Negative vertical gradients indicate downward flow, positive indicates upward flow.

ft = feet

ft/ft = feet per foot

MSL = mean sea level

NM = not measured

ID = identification

MFG = Manufacturing Area Sites

TABLE 3-9

Proposed Sample Plan - Fall 2012 2012 Semi-Annual Groundwater Monitoring Report **Joliet Army Ammunition Plant** Wilmington, Illinois

Site	Well ID	Parameter
L1	In-plume	
	MW131	Е
	MW173	Е
	WES1	Е
	Early Warnii	ng
	WES3	Е
	MW174	Е
	Compliance	?
	SW550	Е
L2	In-plume	
	MW404	Е
	Early Warnii	ng
	MW620	Е
	Compliance	9
	MW621	Е
	SW555	Е
L3/	In-plume/Downgr	
Landfill L3	MW410	Е
	MW412	E, M
	Early Warning/Dow	ngradient
	MW630	E, M
	MW631	E, M
	MW633	E, M
	Compliance/Down;	gradient
	SW777	E, M
	Downgradie	
	SW557	E, M
	SW558	E, M
L14	In-plume	
	MW511	Е
	MW512	Е
	Early Warnii	ng
	H7	Е
	MW603	Е
	MW604	E
M1	In-plume	
	MW107	S
	MW231	S
	MW640	S
	MW641	S
	MW642	S
	Early Warnii	
	MW643	S
	MW644	S
	Compliance	
	MW645	S
	MW646	S
	MW648	S
	MW649	S
	SW709	S
	D # 102	. s

TABLE 3-9

Proposed Sample Plan - Fall 2012 2012 Semi-Annual Groundwater Monitoring Report Joliet Army Ammunition Plant Wilmington, Illinois

Site	Well ID	Parameter
MFG	In-plume	
	MW212R	Е
	MW330	S
	MW652	Е
	Early Warnii	ıg
	MW123R	E
	MW124R	Е
	MW162R	Е
	MW313	Е
	MW318	Е
	MW319	Е
	MW654	Е
	Compliance	?
	MW117	E
	MW118	E
	MW119	Е
Landfill M11	Upgradient	
	MW802	E, I, M, SVOC & V
	Downgradie	
	MW335	E, I, M, SVOC & V
	MW336	E, I, M, SVOC & V
	MW805	E, I, M, SVOC & V
Landfill M13 ⁽¹⁾	Upgradient	
	MW806	E, I, M, SVOC & V
	MW807	E, I, M, SVOC & V
	Downgradie	nt
	MW126R	E, I, M, SVOC & V
	MW362	E, I, M, SVOC & V
	MW808	E, I, M, SVOC & V
	MW809	E, I, M, SVOC & V

General Notes:

V - Volatile Organic Compounds (VOCs)

SVOC - Semivolatile organic compounds

E - Explosives

M - Metals

I - Indicator parameters (Nitrate-N and Sulfate)

S - Sulfate

MFG - Manufacturing Area

Footnotes:

(1) Site M13 Landfill monitoring wells are sampled quarterly for these parameters in compliance with Illinois Administrative Code.

TABLE 4-1

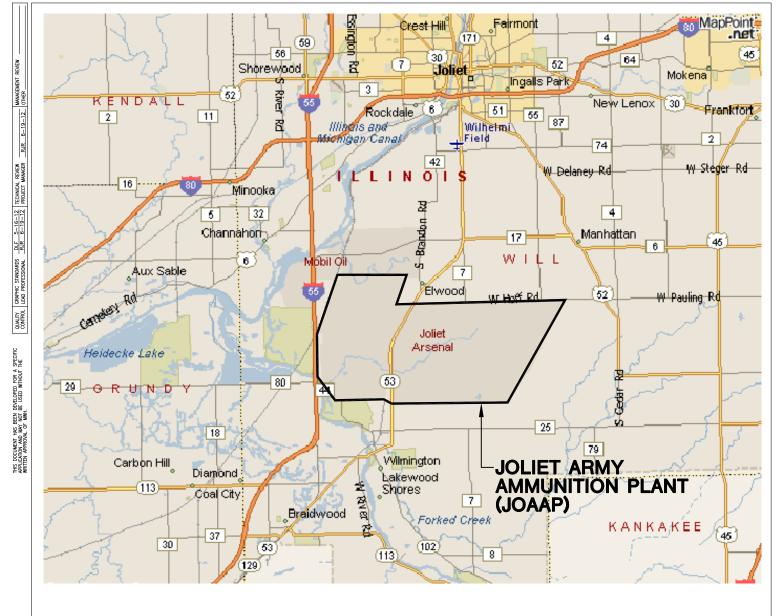
Summary of Recommendations 2012 Semi-annual Groundwater Monitoring Report Joliet Army Ammunition Plant Will County, Illinois

			Status
Report	Recommendation	Reasoning	Initiated/Pending
2009 Semi-annual			
	No recommendations regarding the monitoring program		
2009 Annual			
	Fall Sampling only at L2	Section 4.1.2.5 of LTM Plan, round with highest concentration	Initiated, Site L2 will not be sampled spring 2012
	Remove TAL metals analysis from Site L3 well MW410	No metals exceedances since sampling re-initiated in spring 2008	Initiated, metals at well MW410 were not sampled beginning fall 2011
	Remove Site M5 well MW207R from monitoring program	Section 4.1.7.4 of LTM Plan, no RG exceedances for 4 rounds	Initiated, well MW207R was not sampled beginning fall 2011
	Remove Site M3 wells MW233 and MW352 from monitoring program	Section 4.1.6.5 of LTM Plan, no RG exceedances for 4 rounds	Initiated, wells MW233 and MW352 were not sampled beginning fall 2011
	Prepare closure report for Site M3	Section 4.1.6.6 of LTM Plan, no RG exceedances for 4 rounds	Closure Report will be prepared in 2013
2010 Semi-annual			
	Remove Site L2 well MW501 from monitoring program	Section 4.1.2.5 of LTM Plan, no RG exceedances for 4 rounds	Initiated, well MW501 was not sampled fall beginning 2011
	Fall Sampling only at L14	Section 4.1.4.5 of LTM Plan, round with highest concentration	Initiated, Site L14 will not be sampled spring 2012
	Prepare closure report for Site M5	Section 4.1.7.4 of LTM Plan, no RG exceedances for 4 rounds	Closure Report will be prepared in 2013
	Remove cadmium analysis from Site M6 well MW123R	Section 4.1.7.4 of LTM Plan, no cadmium detections	Initiated, cadmium at well MW123R was not analyzed beginning fall 2010
2010 Annual			
	Remove Site L1 compliance well MW401 from monitoring program	No explosives detections. Site has upgradient early warning wells with no detections	Initiated, well MW401 will not be sampled beginning spring 2012
	Remove Site L1 early warning well MW172 from monitoring program	Well MW172 redundant with well MW173, upward vertical gradients	Initiated, well MW172 will not be sampled beginning spring 2012
	Change designation of Site L1 well MW173 to in-plume	Migration of contaminants	Initiated in 2011 Annual Report
	Remove Site L2 compliance well MW810 from monitoring program	No explosives detections. Site had upgradient early warning wells with no detections	Initiated, L2 is no longer sampled in spring and well MW810 will not be sampled in fall 2012
	Remove Site L3 compliance well MW632 from monitoring program	No explosives detections. Hydraulics suggest well not within migration flowpath	Initiated, well MW632 will not be sampled beginning spring 2012
	Change designation of Site M1 wells MW640, MW641, and MW642 to in-plume	Migration of contaminants	Initiated in 2011 Annual Report
	Remove Site M8 in-plume well MW148RR from monitoring program	In-plume well with no sulfate exceedances since spring 2009	Initiated, well MW148RR will not be sampled beginning spring 2012
	Remove Site M13 wells AEHA14R and AEHA15 from monitoring program and abandon	Problematic wells	Initiated, wells AEHA14R and AEHA15 will not be sampled beginning spring 2012
2011 Semi-annual		,	
	No new recommendations		
2011 Annual			1
	At Site L3/Landfill L3 sample SW004 in spring only	Upstream sample SW555 provides data for fall rounds	Initiated, SW004 will no longer be sampled in fall when Site L2 is sampled
		Rip rap has been washed away at some locations	Pending
	Remove Site Landfill L3/Landfill L3 upgradient well MW03 from monitoring progran		Initiated, well MW03 will not be sampled beginning spring 2012
	Remove Site L14 in-plume well MW508 from monitoring program	No RG exceedances	Initiated, well MW508 will not be sampled beginning spring 2012
	Remove Site L14 compliance wells MW603 and MW604 from monitoring program	Redundant, no RG exceedances in early warning well H7	Initiated, wells MW603 and MW604 will not be sampled beginning spring 2012
	Remove MFG compliance wells MW115 and MW116 from monitoring program	Redundant, no RG exceedances in upgradient Site M6 early warning wells MW123R and MW162R or Site M7 early warning well MW124R	Initiated, wells MW115 and MW116 will not be sampled beginning spring 2012
	Remove MFG compliance wells MW112 and MW113 from monitoring program	Removal of upgradient Site M5 in-plume well MW207R from monitoring program and Site M5 closure	Initiated, wells MW112 and MW113 will not be sampled beginning spring 2012
	Prepare closure report for Site M8	Removal of in-plume well MW148RR from monitoring program	Closure Report will be prepared in 2013
	Fall Sampling only at M11	Section 4.2.2.5 of LTM Plan, stable and predictable results	Pending, recommendation has not been approved. However wells MW333, MW334, MW803, and MW804 will not be sampled in spring 2012
2012 Semi-annual		1	1 1 5
	Rip rap along Prairie Creek at Site L3 required repair	Rip rap has been washed away at some locations	Pending
	Install monitoring well downgradient of Site M13 to replace monitoring wells AEHA14R and AEHA15	Monitoirng wells AEHA14R and AEHA15 removed from monitoring program.	Pending

<u>Notes:</u>
Does not include minor maitenance activities such as replacing well locks.

Does not include recommendations repeated in subsequent reports.



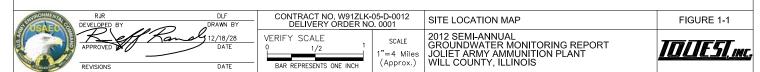


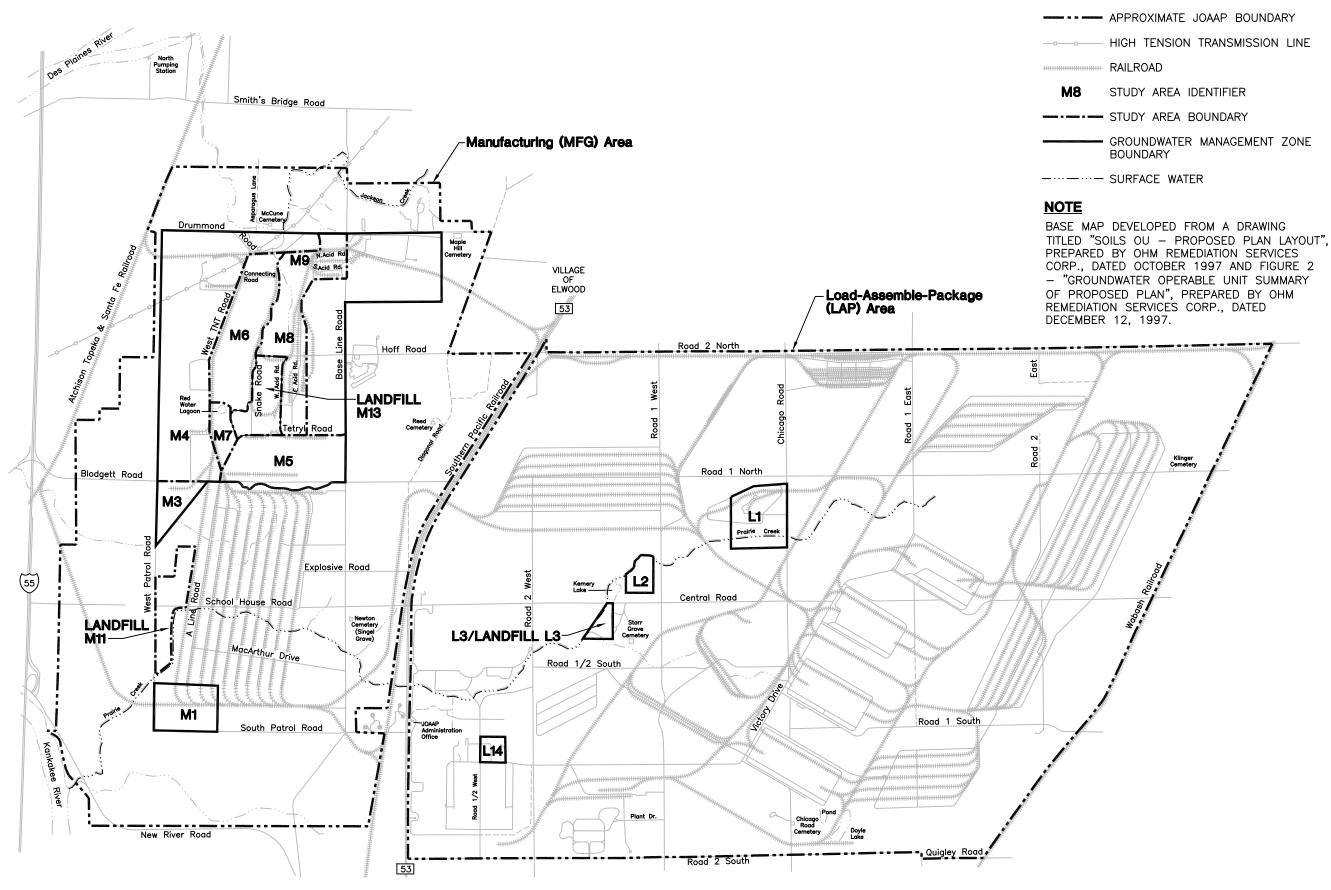


BASE MAP DEVELOPED FROM 2002 MICROSOFT CORPORATION, EXPEDIA.COM.

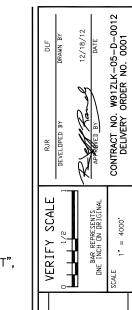












LEGEND

GROUNDWATER STUDY AREAS AND LANDFILL SITES
2012 SEMI-ANNUAL GROUNDWATER MONITORING REPORT
JOLIET ARMY AMMUNITION PLANT

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12/18/2012

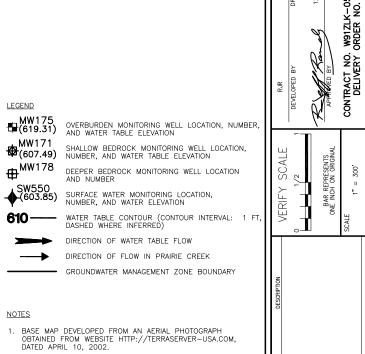
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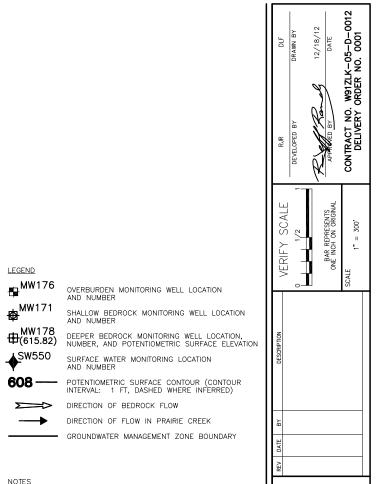
- 2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
- 3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 11 AND 12, 2012.
- 4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
- 5. MW171 IS A SHALLOW BEDROCK MONITORING WELL USED AS A HORIZONTAL CONTROL POINT.

TABLE

FIGURE 3-1







BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.

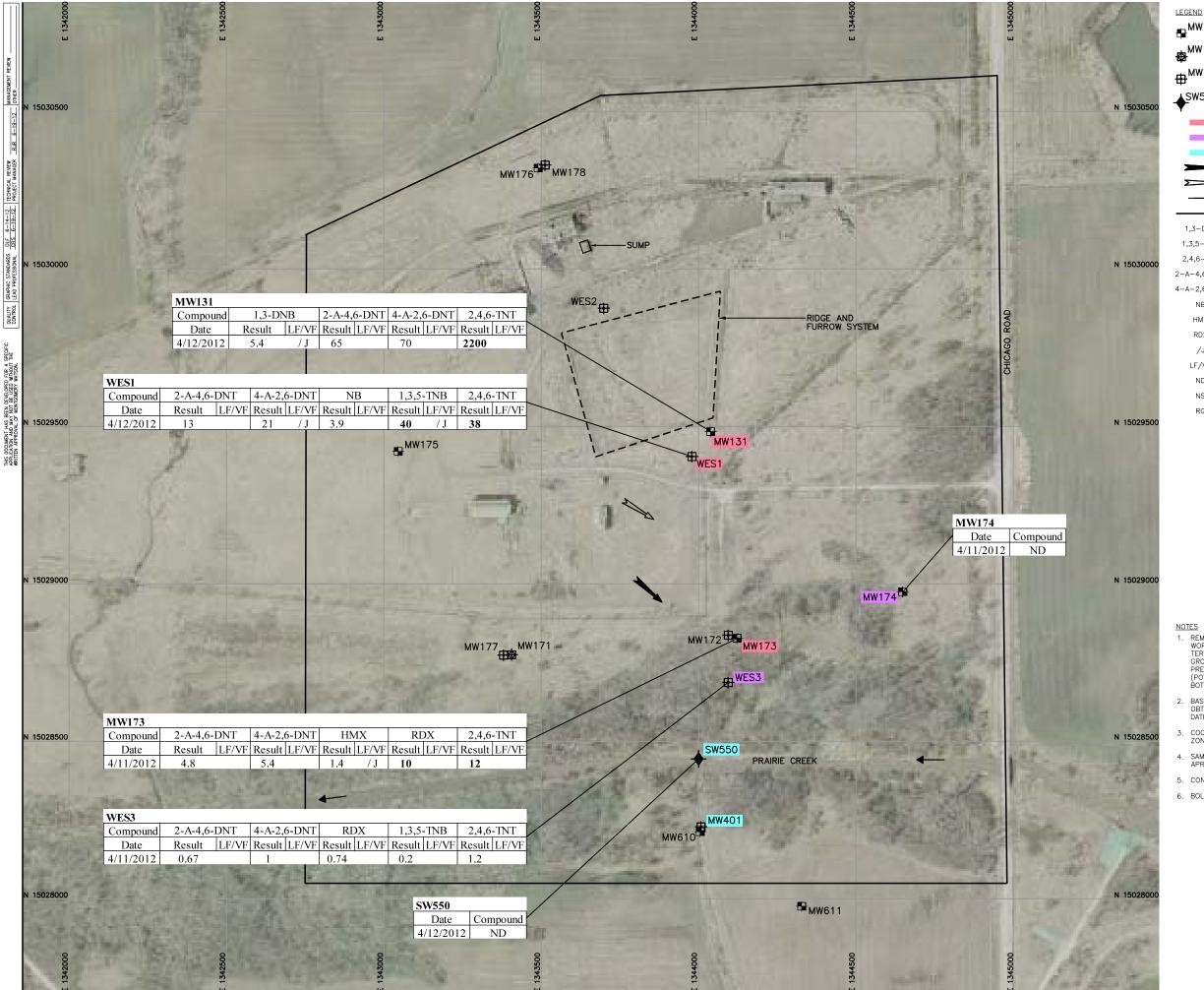
DIRECTION OF BEDROCK FLOW

- 2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
- 3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 11 AND 12, 2012.
- 4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.



FIGURE 3-2





MW1/3	OVERBURI NUMBER,						
<u></u> ₩W171	SHALLOW	BED	ROCK	MONITO	ORING	WELL	LOC

CATION

DEEPER BEDROCK MONITORING WELL LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS

SURFACE WATER MONITORING LOCATION, NUMBER, AND EXPLOSIVES DETECTIONS

IN-PLUME MONITORING POINT

EARLY WARNING MONITORING POINT

COMPLIANCE MONITORING POINT DIRECTION OF WATER TABLE FLOW DIRECTION OF BEDROCK FLOW

DIRECTION OF FLOW IN PRAIRIE CREEK

GROUNDWATER MANAGEMENT ZONE BOUNDARY 1,3-DINITROBENZENE

1.3.5-TNB 1,3,5-TRINITROBENZENE 2,4,6-TNT 2,4,6-TRINITROTOLUENE

2-A-4,6-DNT 2-AMINO-4,6-DINITROTOLUENE 4-A-2,6-DNT 4-AMINO-2,6-DINITROTOLUENE

HIGH MELTING EXPLOSIVE ROYAL DEMOLITION EXPLOSIVE ESTIMATED CONCENTRATION

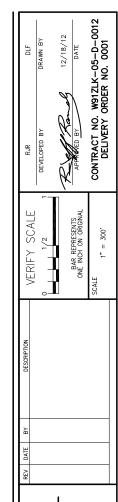
LAB FLAG/VALIDATION FLAG

NOT DETECTED NO STANDARD REMEDIATION GOAL

	Project Action	Surface
Compound	Limit ⁽¹⁾	Water Ro
1,3-DNB	10	4
2-A-4,6-DNT	NS	NS
4-A-2,6-DNT	NS	NS
HMX	5100	260
RDX	2.6	500
1,3,5-TNB	5.1	15
2,4,6-TNT	9.5	75
NB	51	8000

- REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE POTTH AVAILABLE BOTH AVAILABLE.
- BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
- 3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET,
- 4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN
- 5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).
- 6. BOLDED VALUE INDICATES RG EXCEEDANCE.





EXPLOSIVES DETECTIONS — LAP SITE L1 (APRIL 2012)

2012 SEMI—ANNUAL GROUNDWATER M JOLIET ARMY AMMUNITION PLANT WILL COUNTY, ILLINOIS

AREA,

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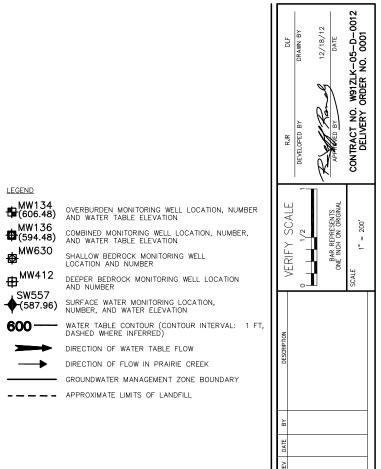
FIGURE 3-3

DRAWING NUMBER 5010401









AREA,

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MAP -2012)

TABLE (APRIL

FEATURES/WATER L3/LANDFILL L3 (

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FIGURE 3-4

DRAWING NUMBER

RE

<u>NOTES</u>

1. BASE MAP DEVELOPED FROM A PLAT OF TOPOGRAPHY PREPARED BY GEOTECH INC., CREST HILL, ILLINOIS, DATED MARCH 9, 2007, AND AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM,

DIRECTION OF WATER TABLE FLOW

- - APPROXIMATE LIMITS OF LANDFILL

- 4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
- 5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM SITE L3 CLOSURE REPORT, PREPARED BY MWH, DATED JUNE 25, 2010.
- 6. MW136 IS A COMBINATION OVERBURDEN/BEDROCK WELL USED AS A HORIZONTAL CONTROL POINT.

- COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
- WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 10 AND 11, 2012.

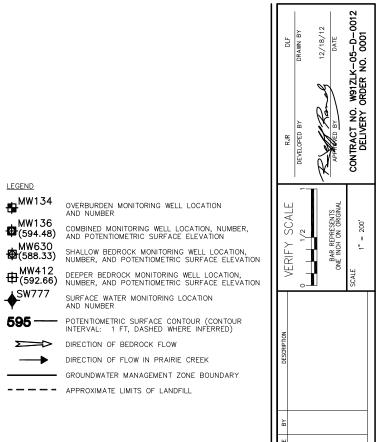
- 7. MW134 IS A SITE L2 MONITORING WELL USED AS A HORIZONTAL CONTROL POINT DUE TO ITS PROXIMITY TO SITE L3/LANDFILL L3.







THIS DOCUMENT HAS E APPLICATION AND MAY WRITTEN APPROVAL OF



1. BASE MAP DEVELOPED FROM A PLAT OF TOPOGRAPHY PREPARED BY GEOTECH INC., CREST HILL, ILLINOIS, DATED MARCH 9, 2007, AND AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.

DIRECTION OF BEDROCK FLOW

- COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
- WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 11, 2012.
- 4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.
- APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM SITE L3 CLOSURE REPORT, PREPARED BY MWH, DATED JUNE 25, 2010.
- 6. MW411 AND MW136 ARE COMBINATION OVERBURDEN/BEDROCK WELLS USED FOR HORIZONTAL CONTROL POINTS.



POTENTIOMETRIC SURFACE MAP — LAP AI SITE L3/LANDFILL L3 (APRIL 2012)

2012 SEMI-ANNUAL GROUNDWATER MONITORING JOLIET ARMY AMMUNITION PLANT WILL COUNTY, ILLINOIS

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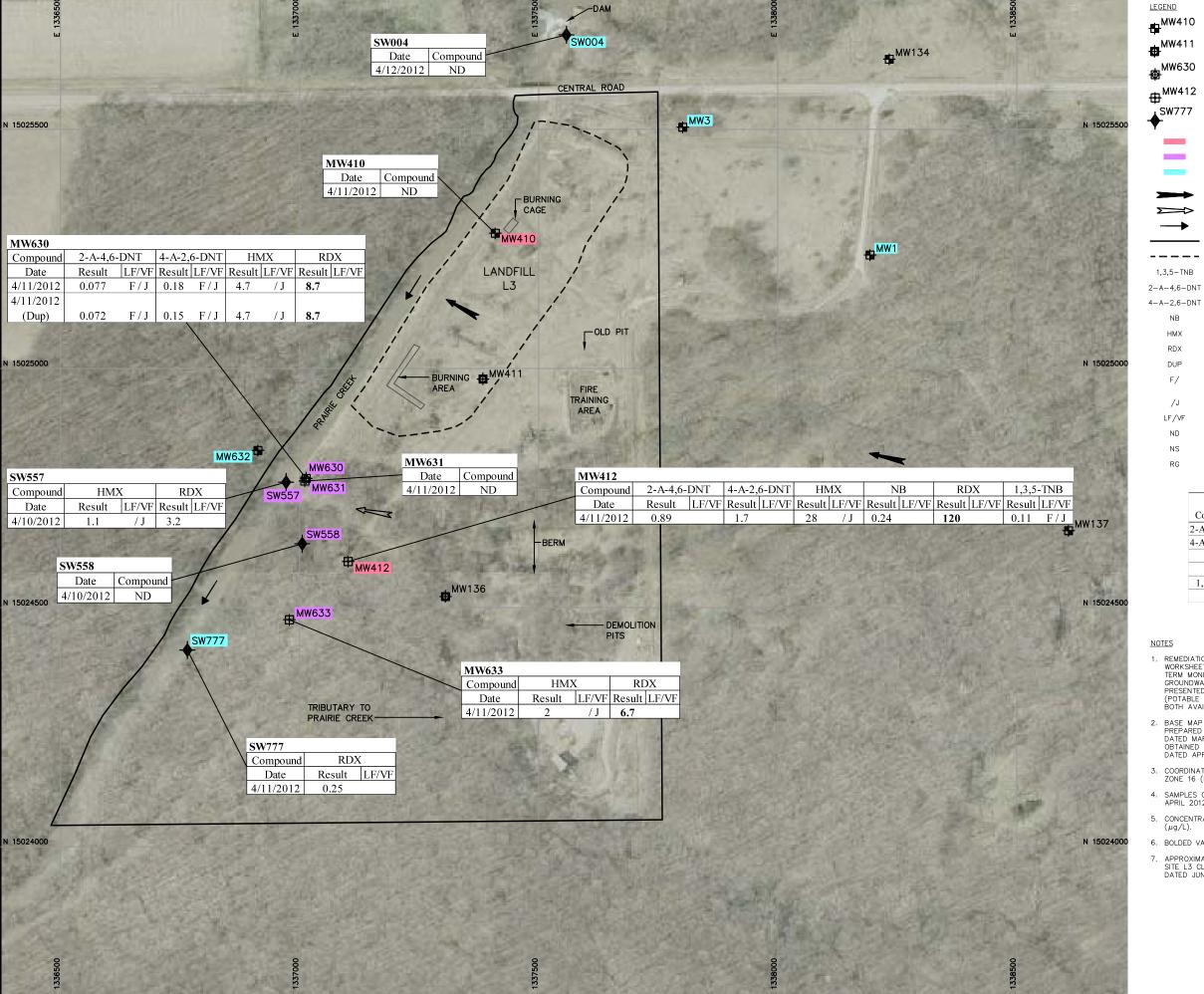
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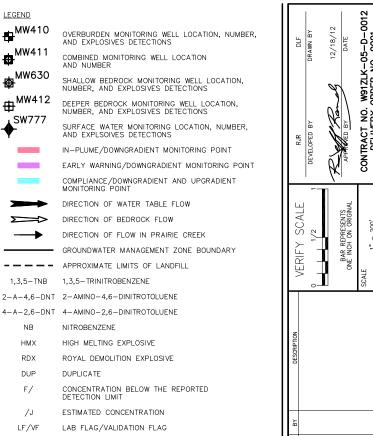
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FIGURE 3-5









Compound	Project Action Limit ⁽¹⁾	Surface Water RG
2-A-4,6-DNT	NS	NS
4-A-2,6-DNT	NS	NS
HMX	5100	260
RDX	2.6	500
1,3,5-TNB	5.1	15
NB	51	8000

NOT DETECTED

NO STANDARD

REMEDIATION GOAL

- 1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
- 2. BASE MAP DEVELOPED FROM A PLAT OF TOPOGRAPHY PREPARED BY GEOTECH INC., CREST HILL, ILLINOIS, DATED MARCH 9, 2007, AND AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM,
- 3. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
- 4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN
- 5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER ($\mu g/L$).
- 6. BOLDED VALUE INDICATES RG EXCEEDANCE.
- APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM SITE L3 CLOSURE REPORT, PREPARED BY MWH, DATED JUNE 25, 2010.



W91ZLK-05-D-001 ORDER NO. 0001 CONTRACT NO. DELIVERY (

OSIVES DETECTIONS – L L3/LANDFILL L3 (APRIL

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FIGURE 3-6







REV DATE BY DESCRIPTION VERIFY SCALE RUR DUF

DEVELOPED BY DRAWN BY

ONE INCH ON ORIGINAL

SCALE

1" = 300'

DELLIVERY ORDER NO. 00001

FER TABLE MAP —
FEA, SITE M1 (APRIL 2012)
SROUNDWATER MONITORING REPTION PLANT

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PRINTED 12/18/2012

FIGURE 3-7







SURFACE MAP –
AREA, SITE M1 (APRIL 2012)
L GROUNDWATER MONITORING REPINITION PLANT

ANUFACTURING AREA, SITE 012 SEMI—ANNUAL GROUNDWAT 012 SEMI—ANNUAL GROUNDWAT 011ET ARMY AMMUNITION PLANT 11 COUNTY 11 INOIS

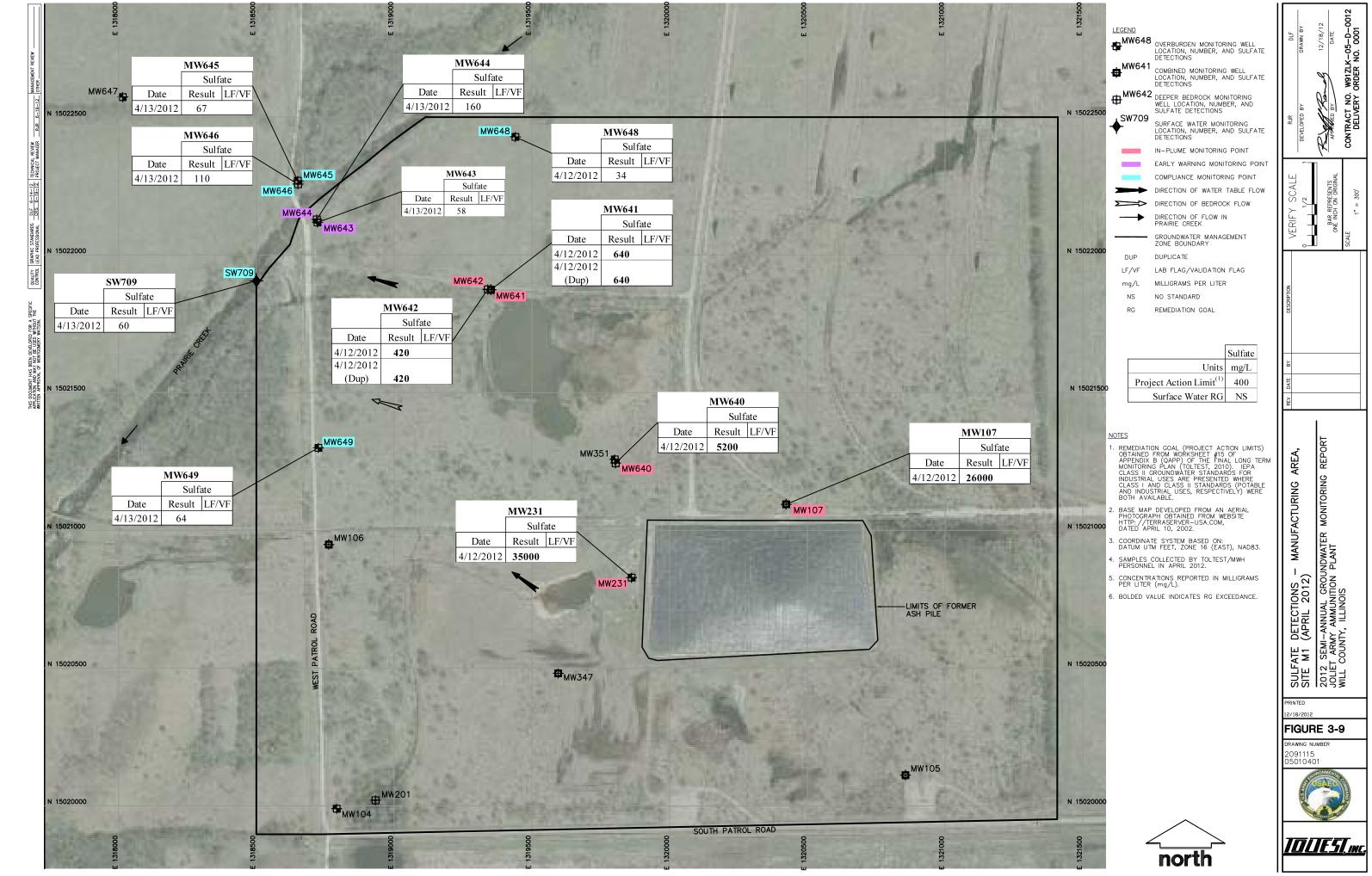
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FIGURE 3-8

FIGURE 3









<u>LEGEND</u>

WW325R
(555.85)

WM652
(553.72)
COMBINED MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION

WW356

WW356

WW356

WW308

DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER

(NM)
NOT MEASURED

WATER TABLE CONTOUR (CONTOUR INTERVAL: 2', DASHED WHERE INFERRED)

DIRECTION OF WATER TABLE FLOW

GROUNDWATER MANAGEMENT ZONE BOUNDARY

STUDY AREA BOUNDARIES

<u>NOTES</u>

- BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
- 2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
- 3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL APRIL 13, 16, AND 17, 2012.
- 4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
- MW117, MW127R, AND MW327R ARE COMBINATION OVERBURDEN/BEDROCK WELLS USED AS HORIZONTAL CONTROL POINTS.

DATE BY DESCRIPTION VERIFY SCALE

ONE INCH ON ORIGINAL

SCALE

T = 1200'

DATE

PART

PART

DEVELOPED BY

DELIVERY ORDER NO. 00001



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FIGURE 3-10

IDLIESI, INC.





■ MW325R
 OVERBURDEN MONITORING WELL LOCATION AND NUMBER

 ■ MW350
 COMBINED MONITORING WELL LOCATION AND NUMBER

 ■ MW356R
 (542.03)
 NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION (NM)
 NOT MEASURED

 ■ POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL: 2 FT, DASHED WHERE INFERRED)

 ■ DIRECTION OF BEDROCK FLOW

GROUNDWATER MANAGEMENT ZONE BOUNDARY

<u>NOTES</u>

- BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
- COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.

-- STUDY AREA BOUNDARIES

- 3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL APRIL 13, 16, AND 17, 2012.
- 4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.

DATE BY DESCRIPTION VERIFY SCALE

RASK

DEVELOPED BY

DEVE

POTENTIOMETRIC SURFACE MAP — MANUFACTURING AREA, MFG — SITES M3, M4, M5, M6, M7, M8, M9, M13, AND OTHER AREAS (APRIL 2012)

2012 SEMI—ANNUAL GROUNDWATER MONITORING REPORT JOLIET ARMY AMMUNITION PLANT WILL COUNTY, ILLINOIS

FIGURE 3-11

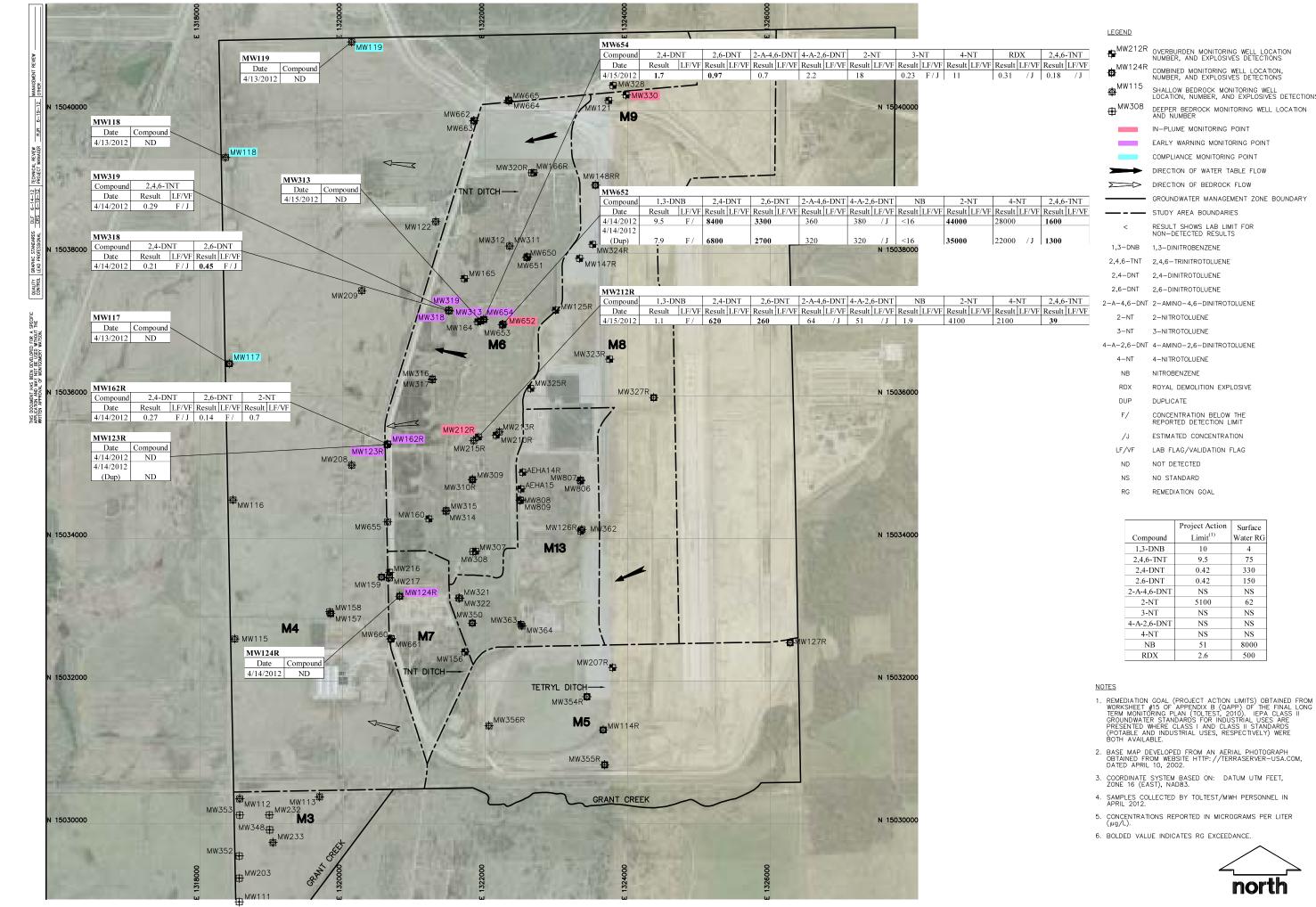
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FIGURE 3-12

DRAWING NUMBER 2091115

0501040









MW802

(536.73)

MW3.34

(532.81)

Water table contour (contour interval; 1 ft, dashed where inferred)

Direction of flow in prairie creek

STUDY AREA BOUNDARY

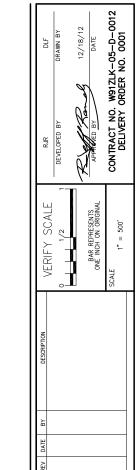
NOT

 BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.

APPROXIMATE LIMITS OF LANDFILL

- COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
- WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 16, 2012.
- 4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
- 5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M11 NEW WELL LOCATIONS", PROJECT NO. 7—61M—11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED JANUARY 2008.
- 6. MW334 AND MW335 ARE SHALLOW BEDROCK WELLS, AND MW802 AND MW804 ARE COMBINATION OVERBURDEN/BEDROCK WELLS USED AS HORIZONTAL CONTROL POINTS.





FEATURES/WATER TABLE MAP —
UFACTURING AREA, SITE M11 LANDFILL (APP
2 SEMI—ANNUAL GROUNDWATER MONITORING
ET ARMY AMMUNITION PLANT
COUNTY, ILLINOIS

2012)

FIGURE 3-13DRAWING NUMBER
2091115

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₩MW647 OVERBURDEN MONITORING WELL LOCATION AND NUMBER ₩802 COMBINED MONITORING WELL LOCATION AND NUMBER MW803 **(540.27)** SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION 535 -POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED) DIRECTION OF BEDROCK FLOW

DIRECTION OF FLOW IN PRAIRIE CREEK

- BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
- 2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.

STUDY AREA BOUNDARY APPROXIMATE LIMITS OF LANDFILL

- WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 16, 2012.
- 4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.
- APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M11 NEW WELL LOCATIONS", PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED JANUARY 2008.



W91ZLK-05-D-0012 ORDER NO. 0001 CONTRACT NO. DELIVERY (

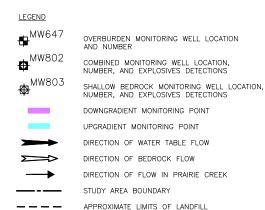
2012) SURFACE MAP -AREA, SITE M11 I

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FIGURE 3-14







NOT DETECTED

NOTES

- 1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
- BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
- COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
- 4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN APRIL 2012.
- 5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L).
- APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M11 NEW WELL LOCATIONS", PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED JANUARY 2008.



EXPLOSIVES DETECTIONS — MANUFACTURING AREA, SITE M11 LANDFILL (APRIL 2012)

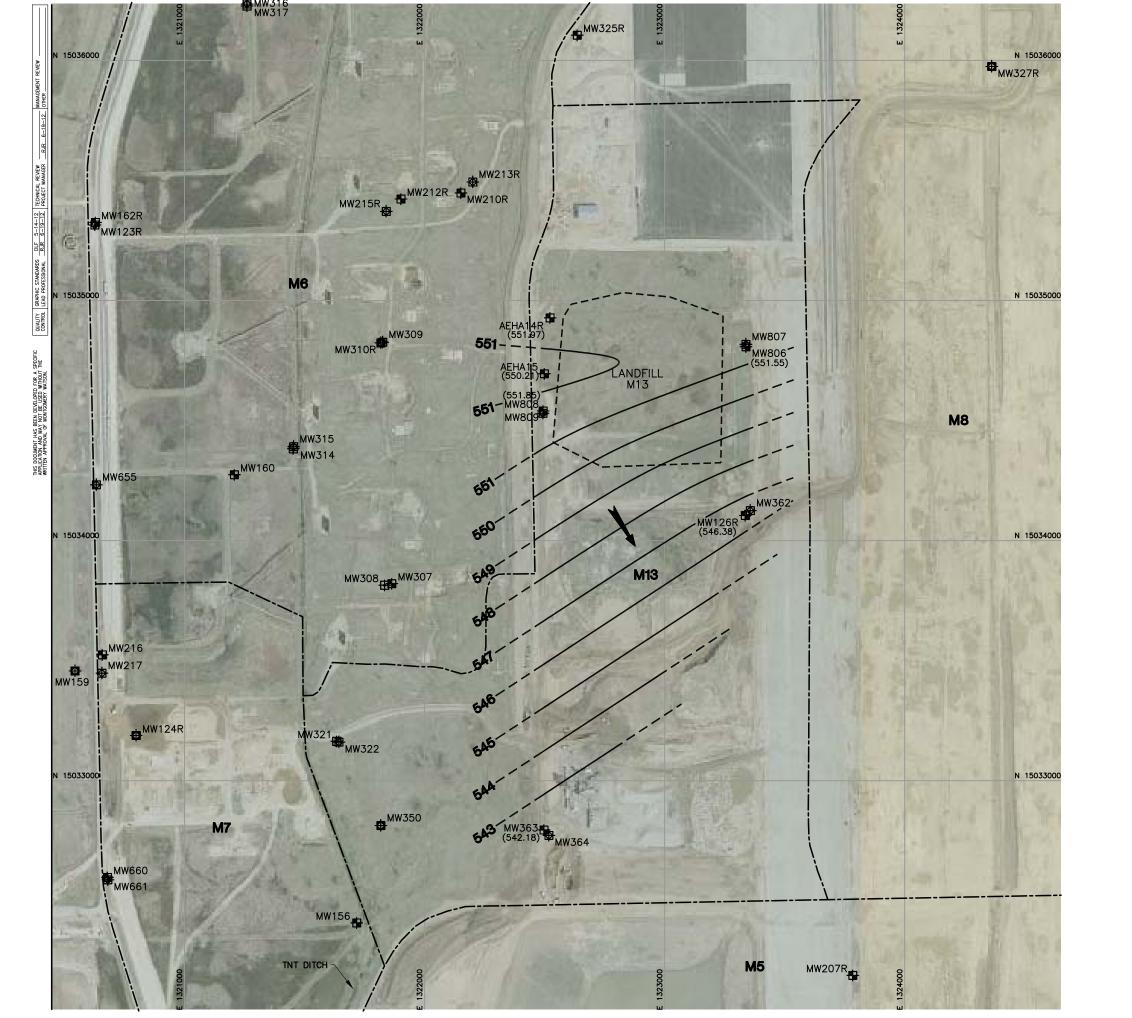
2012 SEMI-ANNUAL GROUNDWATER MONITORING REPJOLIET ARMY AMMUNITION PLANT WILL COUNTY, ILLINOIS

FIGURE 3-15

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₩126R (546.38) MW350

OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION

COMBINED MONITORING WELL LOCATION AND NUMBER

₩MW356 SHALLOW BEDROCK MONITORING WELL LOCATION AND NUMBER ⊕^{MW308} DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER

WATER TABLE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED)

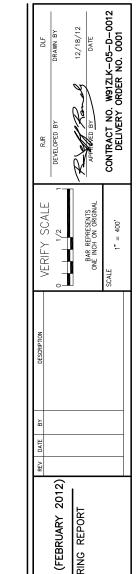
DIRECTION OF WATER TABLE FLOW

STUDY AREA BOUNDARIES

APPROXIMATE LIMITS OF LANDFILL

- COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
- 3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON FEBRUARY 29, 2012.
- 5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M13 NEW WELL LOCATIONS", FIGURE 1, PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED MAY 2008.



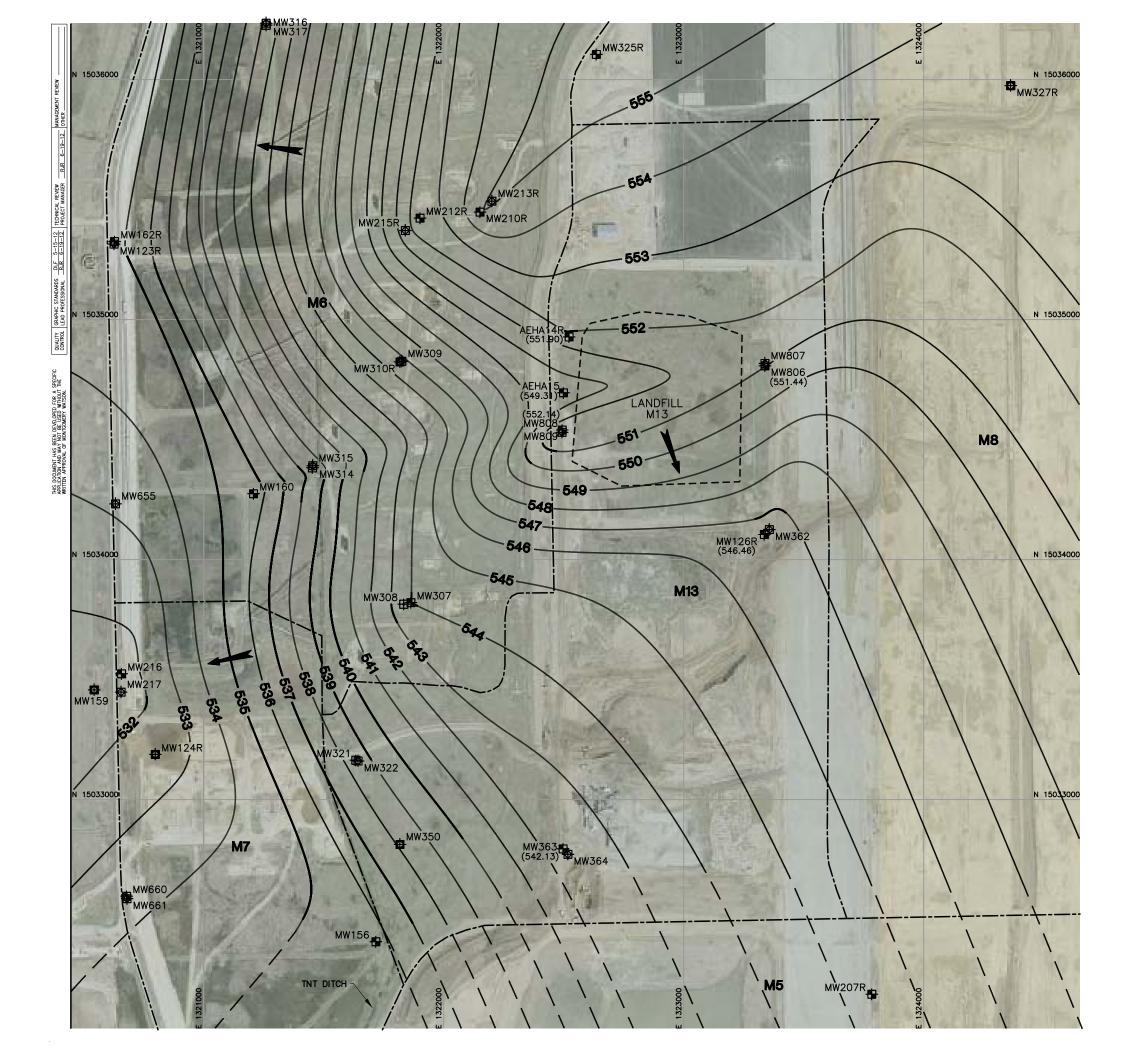


LANDFILL

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FIGURE 3-16 DRAWING NUMBER

- BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.



LEGEND ₩MW126R (546.46) OVERBURDEN MONITORING WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION MW350 COMBINED MONITORING WELL LOCATION AND NUMBER **₩**W356 SHALLOW BEDROCK MONITORING WELL LOCATION AND NUMBER ₩^{MW308} DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER 550 -WATER TABLE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED) DIRECTION OF WATER TABLE FLOW STUDY AREA BOUNDARIES APPROXIMATE LIMITS OF LANDFILL

<u>NOTES</u>

- BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
- COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
- WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 16, 2012.
- 4. MONITORING WELLS USED TO CREATE THE WATER TABLE MAP ARE SHOWN WITH ELEVATIONS.
- 5. SEE FIGURE 3-10 FOR GROUNDWATER ELEVATIONS OF MONITORING WELLS AT SITES ADJACENT TO M13.
- APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M13 NEW WELL LOCATIONS", FIGURE 1, PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED MAY 2008.

DLF CONTRACT NO. DELIVERY C VERIFY 2012)

WATER TABLE MAP —
MANUFACTURING AREA, SITE M13 LAN
2012 SEMI—ANNUAL GROUNDWATER M
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED

(APRIL

M13 LANDFILL

FIGURE 3-17

5010401











MW126R

OVERBURDEN MONITORING WELL LOCATION
AND NUMBER

COMBINED MONITORING WELL LOCATION
AND NUMBER

WW362

SHALLOW BEDROCK MONITORING WELL LOCATION,
NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION
AND NUMBER

DEEPER BEDROCK MONITORING WELL LOCATION
AND NUMBER

DETERMINENT SURFACE CONTOUR (CONTOUR
INTERVAL; 1 FT, DASHED WHERE INFERRED)

DIRECTION OF BEDROCK FLOW

NOTE

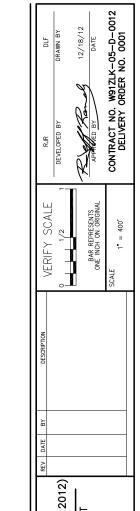
 BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.

STUDY AREA BOUNDARIES

APPROXIMATE LIMITS OF LANDFILL

- 2. COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
- 3. WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON FEBRUARY 29, 2012.
- 4. MONITORING WELLS USED TO CREATE THE POTENTIOMETRIC SURFACE MAP ARE SHOWN WITH ELEVATIONS.
- 5. APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M13 NEW WELL LOCATIONS", FIGURE 1, PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED MAY 2008.





(FEBRUARY

LANDFILL

SURFACE MAP -AREA, SITE M13 I

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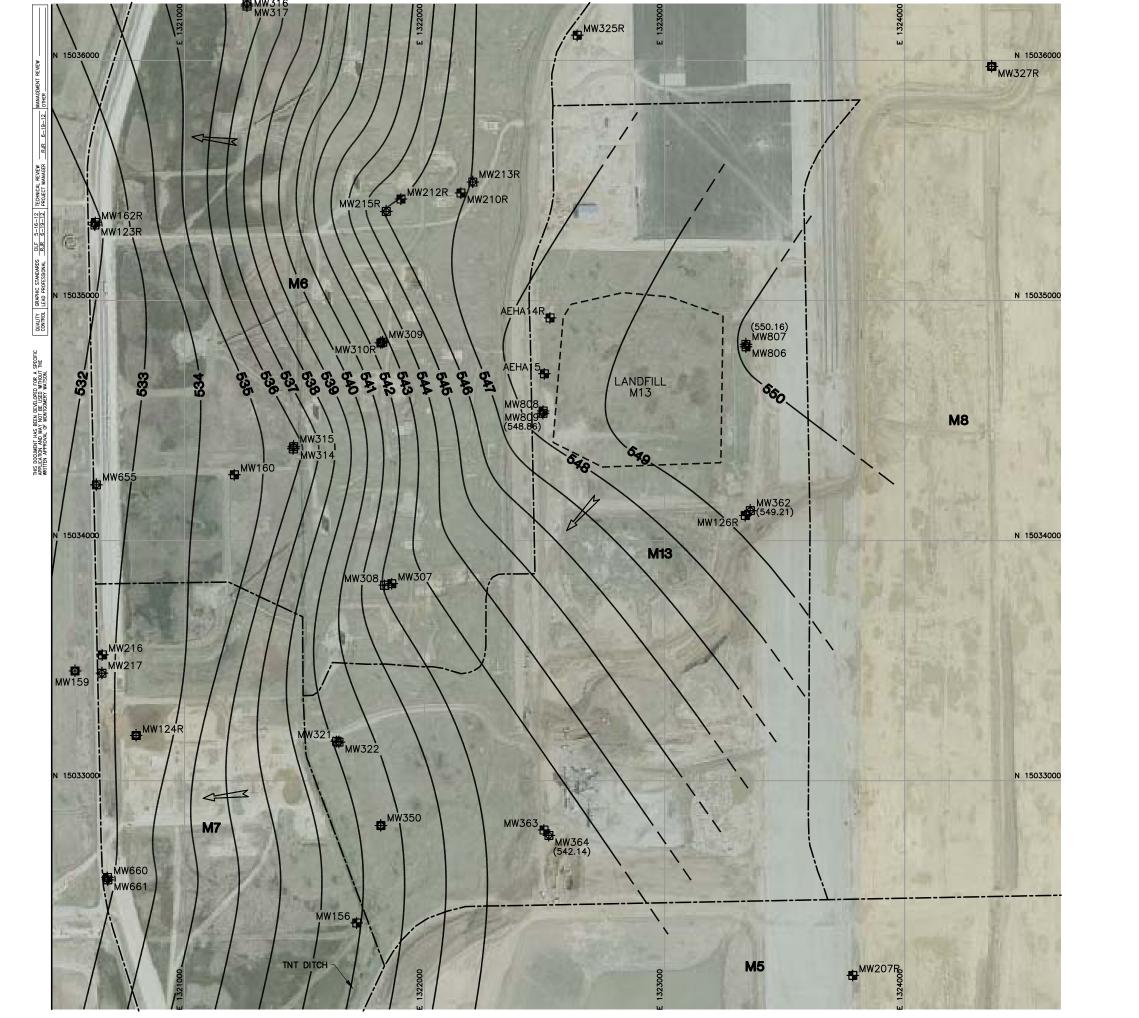
FIGURE 3-18

DRAWING NUMBER

2091115
05010401









LEGEND ₩W126R OVERBURDEN MONITORING WELL LOCATION AND NUMBER **₩**W350 COMBINED MONITORING WELL LOCATION AND NUMBER ₩362 (549.21) SHALLOW BEDROCK MONITORING WELL LOCATION, NUMBER, AND POTENTIOMETRIC SURFACE ELEVATION ₩^{MW308} DEEPER BEDROCK MONITORING WELL LOCATION AND NUMBER POTENTIOMETRIC SURFACE CONTOUR (CONTOUR INTERVAL; 1 FT, DASHED WHERE INFERRED) DIRECTION OF BEDROCK FLOW STUDY AREA BOUNDARIES

APPROXIMATE LIMITS OF LANDFILL

- BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH OBTAINED FROM WEBSITE HTTP://TERRASERVER-USA.COM, DATED APRIL 10, 2002.
- COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD 83.
- WATER LEVELS MEASURED BY TOLTEST/MWH PERSONNEL ON APRIL 16, 2012.
- 5. SEE FIGURE 3-11 FOR GROUNDWATER ELEVATIONS OF MONITORING WELLS AT SITES ADJACENT TO M13.
- APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M13 NEW WELL LOCATIONS", FIGURE 1, PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED MAY 2008.

W91ZLK-05-D-0012 ORDER NO. 0001 CONTRACT NO. DELIVERY (

2012)

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LANDFILL

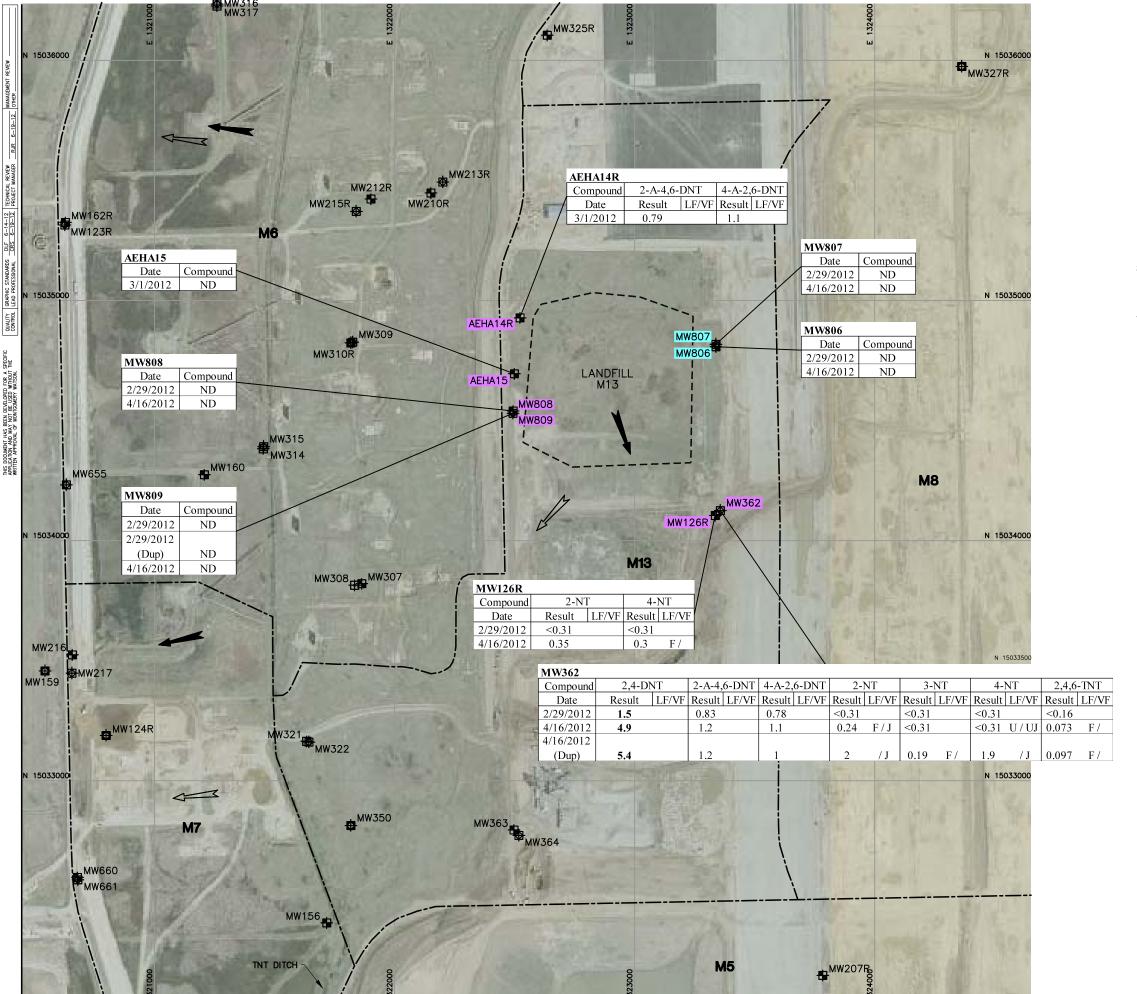
SURFACE MAP -AREA, SITE M13 L

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FIGURE 3-19







MW126R

OVERBURDEN MONITORING WELL LOCATION,
NUMBER, AND EXPLOSIVES DETECTIONS

MW362

SHALLOW BEDROCK MONITORING WELL LOCATION,
NUMBER, AND EXPLOSIVES DETECTIONS

DEPER BEDROCK MONITORING WELL LOCATION,
NUMBER, AND EXPLOSIVES DETECTIONS

DEPER BEDROCK MONITORING WELL LOCATION
AND NUMBER

DOWNGRADIENT MONITORING POINT

UPGRADIENT MONITORING POINT

DIRECTION OF WATER TABLE FLOW

DIRECTION OF BEDROCK FLOW

RESULT SHOWS LAB LIMIT FOR NON-DETECTED RESULTS
2,4-DNT
2,4-DINITROTOLUENE

2,4,6-TRINITROTOLUENE

APPROXIMATE LIMITS OF LANDFILL

STUDY AREA BOUNDARIES

2-A-4,6-DNT 2-AMINO-4,6-DINITROTOLUENE
2-NT 2-NITROTOLUENE

2,4,6-TNT

3-NT 3-NITROTOLUENE
4-A-2,6-DNT 4-AMINO-2,6-DINITROTOLUENE

4-NT 4-NITROTOLUENE

DUP DUPLICATE

CONCENTRATION BELOW THE REPORTED DETECTION LIMIT

J ESTIMATED CONCENTRATION

U/ NOT DETECTED

/UJ ESTIMATED DETECTION LIMIT

LF/VF LAB FLAG/VALIDATION FLAG

ND NOT DETECTED

NS NO STANDARD

RG REMEDIATION GOAL

	Project Action	Surface
Compound	Limit ⁽¹⁾	Water RG
2,4-DNT	0.42	330
2,4,6-TNT	9.5	75
2-A-4,6-DNT	NS	NS
2-NT	5100	62
3-NT	NS	NS
4-A-2,6-DNT	NS	NS
4-NT	NS	NS

NOTES

- 1. REMEDIATION GOAL (PROJECT ACTION LIMITS) OBTAINED FROM WORKSHEET #15 OF APPENDIX B (QAPP) OF THE FINAL LONG TERM MONITORING PLAN (TOLTEST, 2010). IEPA CLASS II GROUNDWATER STANDARDS FOR INDUSTRIAL USES ARE PRESENTED WHERE CLASS I AND CLASS II STANDARDS (POTABLE AND INDUSTRIAL USES, RESPECTIVELY) WERE BOTH AVAILABLE.
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- COORDINATE SYSTEM BASED ON: DATUM UTM FEET, ZONE 16 (EAST), NAD83.
- 4. SAMPLES COLLECTED BY TOLTEST/MWH PERSONNEL IN FEBRUARY, MARCH, AND APRIL 2012.
- 5. CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER ($\mu g/L$).
- 6. BOLDED VALUE INDICATES RG EXCEEDANCE.
- APPROXIMATE LIMITS OF LANDFILL OBTAINED FROM A DRAWING, "M13 NEW WELL LOCATIONS", FIGURE 1, PROJECT NO. 7-61M-11686, PREPARED BY AMEC EARTH & ENVIRONMENTAL, DATED MAY 2008.



E BY
DESCRIPTION
VERIFY SCALE

DEVELOPED BY

EXPLOSIVES DETECTIONS —
MANUFACTURING AREA, SITE M13 LANDFILL (2012)

2012 SEMI—ANNUAL GROUNDWATER MONITORING RE
JOLIET ARMY AMMUNITION PLANT
WILL COUNTY, ILLINOIS

PRINTED 12/19/2012

FIGURE 3-20
DRAWING NUMBER

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APPENDIX A

LANDFILL INSPECTION REPORTS

A1 – LANDFILL INSPECTION REPORT – MARCH 2012

A2 – LANDFILL INSPECTION REPORT – APRIL 2012

A1 – LANDFILL INSPECTION REPORT – MARCH 2012

POST-CLOSURE INSPECTION REPORT FOR LANDFILLS L3, M11, AND M13

for the Performance-Based Acquisition of Environmental Remediation Services at Joliet Army Ammunition Plant Joliet, Illinois

March 2012

Submitted to:



US Army Contracting Agency
APG Directorate of Contracting - AEC Team
E4460 Beal Road, APG-EA, MD 21010

Contract Number: W91ZLK-05-D-0012
Delivery Order No. 0001

TolTest Project Number: 22271.01

Submitted by:



1480 Ford Street Maumee, OH 43537 (419) 794-3500

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

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03-1-2012		Techni	ical		J	anuary to March 2012
4. TITLE AND SUBTITLE		ļ	5a. CONTRACT NUMBER			
Post-Closure Inspection Report for	Landfills L	3, M11 and M13				LK-05-D-0012
for the 2008 Performance-Base	d Acquisit	tion for Environme	ental	5b. GRA	ANT NUM	BER
Remediation, Joliet Army Ammun	ition Plant,]	Joliet, Illinois				NA
			Į	5c. PRO	GRAM ELE	MENT NUMBER
						NA
6. AUTHOR(S)			ļ	5d. PRO	JECT NUM	BER
TolTest, Inc.					-	ery Order 0001
			[5e. TAS	K NUMBER	
						NA
			[5f. WOI	RK UNIT NU	JMBER
						NA
PERFORMING ORGANIZATIO	N NAME(S	S) AND ADDRESS(ES	S)		8. PERFOR	MING ORGANIZATION
TolTest, Inc.					REPORT N	UMBER
1480 Ford Street						
Maumee, OH 44087						
9. SPONSORING/MONITOR	ING AGE	NCY NAME(S) AN	ID		10. SPONS	OR/MONITOR'S
ADDESS(ES)					ACRONYN	1(S)
USAEC - Louisville District						CELRL-ED-EE
Aberdeen Proving Ground – W	91ZLK				11. SPON	SOR/MONITOR'S REPORT
4118 Susquehanna Ave					NUMBER	
Aberdeen Proving Ground, MI) 21005-30	13				NA
12. DISTRIBUTION/AVAILABIL	ITY STATE	EMENT				
Reference Distribution Page						
13. SUPPLEMENTARY NOTES						
None.						
14. ABSTRACT						
This Post-Closure Inspection report	rt presents 7	TolTest's findings for	the co	onditions	at landfills	L3, M11 and M13 pursuant to
the requirements of the Performan	ce-Based Co	ontract for Environme	ental R	Remediati	on at the Joli	et Army Ammunition Plant.
15. SUBJECT TERMS						
Landfill, Inspection Report, L3, M1	.1, M13	1				
16. SECURITY CLASSIFICATION	N OF: 1	17. LIMITATION	18 NU	J MBER C	OF PAGES	19a. NAME OF
	C	OF ABSTRACT				RESPONSIBLE PERSON
a. REPORT b. ABSTRACT c. THIS	S PAGE					19b. TELEPHONE
						NUMBER (Include area code)

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POST-CLOSURE INSPECTION REPORT FOR LANDFILLS L3, M11, AND M13

for the Performance-Based Acquisition of Environmental Remediation Services at Joliet Army Ammunition Plant Joliet, Illinois

Submitted to:



US Army Contracting Agency
APG Directorate of Contracting - AEC Team
E4460 Beal Road, APG-EA, MD 21010

Contract Number: W91ZLK-05-D-0012
Delivery Order No. 0001

TolTest Project Number: 22271.01

Submitted by:



1480 Ford Street Maumee, OH 43537 (419) 794-3500

March 2012

DOCUMENT DISTRIBUTION for the Post-Closure Inspection Report for Landfills L3, M11, and M13 for the Performance-Based Acquisition of Environmental Remediation Joliet Army Ammunition Plant Joliet, Illinois

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Organization	Paper	Electronic	
Joliet Army Ammunition Plant	2	2	
Joliet Environmental Information Management System	0	1	
United States Army Environmental Command	1	2	
United States Army Corps of Engineers - Louisville District	0	2	

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2.0 Landfill Descriptions	1
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Attachment B	Inspection Photographs

LIST OF ACRONYMS

GMZ Ground Water Monitoring Zone
IAC Illinois Administrative Code
JOAAP Joliet Army Ammunition Plant
L3 JOAAP Landfill L3
M11 JOAAP Landfill M11
M13 JOAAP Landfill M13
RA Remedial Action
RG Remedial Goal
USAEC United States Army Environmental Command



POST-CLOSURE INSPECTION REPORT

1.0 Introduction

This document has been prepared for the United States Army Environmental Command to provide documentation of the conditions of three landfills (L3, M11, and M13) located at the former Joliet Army Ammunition Plant (JOAAP).

Post-closure monitoring requirements for Landfills L3, M11 and M13 are mandated by Illinois Administrative Code (IAC) Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for a period of 30 years. Objectives include:

- Confirm that the landfill cap has controlled leaching so that water quality will not be threatened in the future;
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed; and
- Keep survey points protected and visible to facilitate identification in the future.

1.1 Landfill Cover Maintenance

According to IAC, the Landfills L3, M11 and M13 covers will be inspected on a quarterly basis for:

- Depressions indicating subsidence or other deformations that could breach the cover;
- Erosion features;
- Growth of deep rooted vegetation or invasive species that would adversely affect evapotranspiration and/or erosion armoring; and
- Debris or blockage of drainage structures.

Any damages or changes noted will be repaired to comply with the final design specifications for the cover.

Site inspections were conducted on 1 March 2012 for landfill M13, M11 and L3. This report includes copies of the inspection checklist, photographs, recommendations, and conclusions. The Post-Closure Inspection Checklists are found in Attachment A, and Inspection Photographs are found in Attachment B.

2.0 Landfill Descriptions

2.1 Landfill L3

Landfill L3 is located on the western edge of the Site L3 GMZ on the east bank of Prairie Creek. The GMZ comprises approximately 50 acres used as a demolition area directly southwest of Site L2, of which the landfill occupies only 3.32 acres. The area of Landfill L3 was originally contaminated through import of contaminated fill. However, other waste and contaminated soil have been moved to the site as a part of the L3 RA in order to consolidate residual contamination into a smaller footprint. The remedy selected for the consolidated area along Prairie Creek was capping to form Landfill L3. Implementation of the remedy began in 2007 and was completed in 2008.

Landfill L3 is believed to contain metals and explosive residues that could continue to contaminate the underlying groundwater and migrate to Prairie Creek. Because the landfill is bordered by Prairie Creek, any contamination that infiltrates from the filled area would be expected to migrate to Prairie Creek and quickly be discharged as the groundwater flows upward into the surface water body.



2.1.1 Monitoring Locations

Both groundwater and surface water sample points are monitored at Landfill L3 during spring and fall sampling rounds as follows:

- Upgradient Locations
 - SW004 (Surface location where Prairie Creek first enters the L3 GMZ boundary and upstream of the storm water outfall, spring only).
- Downgradient Locations
 - MW410
 - MW412
 - MW630
 - MW631
 - MW633
 - SW777 (Surface water location in Prairie Creek near the L3 GMZ boundary)
 - SW557 (Surface water location in Prairie Creek just upstream of the landfill drainage swale discharge)
 - SW558 (Surface water location at the constructed drainage swale along the southwest side of the newly constructed landfill)

2.2 Landfill M11

Landfill M11 is located in the southwestern portion of the manufacturing side of JOAAP. The GMZ comprises approximately 133 acres. Site M11 was divided into two sections by School House Road and bordered on the west by West Patrol Road. M11 north encompassed approximately 10.5 acres of former gravel pits that were mined and filled with waste. M11 south, a former gravel pit, encompassed approximately 5.6 acres that was also mined and filled with waste. The remedy chosen for Landfill M11 was waste consolidation and capping. Implementation of the remedy began in 2006 and was completed in 2008.

The current conceptual site model is that Landfill M11 is believed to contain manganese and sulfate containing waste that could potentially contaminate underlying groundwater and migrate beyond the GMZ.

With the implementation of the RA at Site M11, it is anticipated that the landfill cap will prevent percolation of precipitation through waste consolidated in the landfill thus, preventing groundwater contamination.

2.2.1 Monitoring Locations

Groundwater sample points are monitored at Landfill M11 in fall as follows:

- Upgradient Locations
 - MW802
 - MW803
- Downgradient Locations



- MW333
- MW334
- MW335
- MW336
- MW804
- MW805

In April 2012 samples will be collected from wells MW802, MW335, MW336, and MW805 only.

2.3 Landfill M13

Landfill M13 comprises approximately 106 acres of the central portion of the MFG Area known as the gravel pits. It lies north of the Tetryl Production Area, east of the TNT Ditch Complex, and west of the Acid Area. Disposal activities were confined to four discrete areas on the site, none of which extended beyond 12 acres in size. Historical records indicate landfill disposal took place in the Northern Gravel Pit during the period 1966 to 1984 and involved scrap metals, creosote-treated railroad ties, telephone poles, and construction/demolition debris. The three other pits received waste materials that do not appear to pose a threat to human health and the environment.

Soil in the vicinity of the Northern Gravel Pit had been found to contain beryllium, lead, and benzo(a)pyrene as COCs. Explosive compounds that have been observed in groundwater at Site M13 include: TNT, TNB, 2,4-DNT, and 2,6-DNT. On a single occasion in 1991, antimony and cadmium were reported to be present at concentrations in excess of their respective RGs, but they have not exceeded the RGs since then. It is difficult to determine if the original findings could have resulted from turbid samples since low flow sampling and micro purging techniques are now employed to obtain more representative samples.

The current conceptual site model is that metal and benzo(a) pyrene in groundwater may be present as a result of leaching of waste materials in the Northern Gravel Pit. The explosives present in groundwater are far more likely to be present due to infiltration of wastewater in the TNT Ditch. There is no evidence to suggest explosive compounds were ever present in waste materials put into the pit.

With the implementation of the RA on the TNT Ditch and the capping of the Northern Gravel Pit, it is anticipated that contaminants in site groundwater will detach from the source areas and migrate as legacy plumes to the west. As such, concentrations are expected to decline with time.

2.3.1 Monitoring Locations

Groundwater is monitored quarterly through sample collection and analysis at six monitoring wells:

- Upgradient or background wells
 - MW806
 - MW807
- Crossgradient
 - MW126R
 - MW362
- Downgradient or source control wells



- MW808
- MW809

3.0 Inspection Results

The following are the observations from the landfill inspections conducted at L3, M11, and M13 on 1 March 2012.

3.1 Landfill L3

The perimeter fence and site postings were in good condition. The vegetative cover was well established and no erosion or woody plants were observed. No subsidence was observed nor was there any evidence of damage due to burrowing animals.

The rip rap along Prairie Creek at Site L3 has been washed away at several locations and is in need of repair. Although small areas of the synthetic cap is exposed at several locations as a result of the rip rap being washed away, the landfill appears to be stable and does not appear to be failing. The remaining rip rap also appears to be stable.

3.2 Landfill M11

The perimeter fence, gate and site postings were in good condition. The vegetative cover was well established and no erosion or woody plants were observed. The rip rap along the perimeter was evenly applied and no erosion channels were detected. There was no evidence of damage due to burrowing animals. The vents were undamaged and appeared to be in working order.

3.3 Landfill M13

The perimeter fence, gate and site postings were in good condition. The vegetative cover was well established and no erosion or woody plants were observed. The rip rap along the perimeter was evenly applied and no erosion channels were detected. The vents were undamaged and appeared to be in working order.

4.0 Conclusions and Recommendations

The deficiencies noted within this report which need to be addressed include the following:

Landfill L3:

• Repair rip rap along Prairie creek.

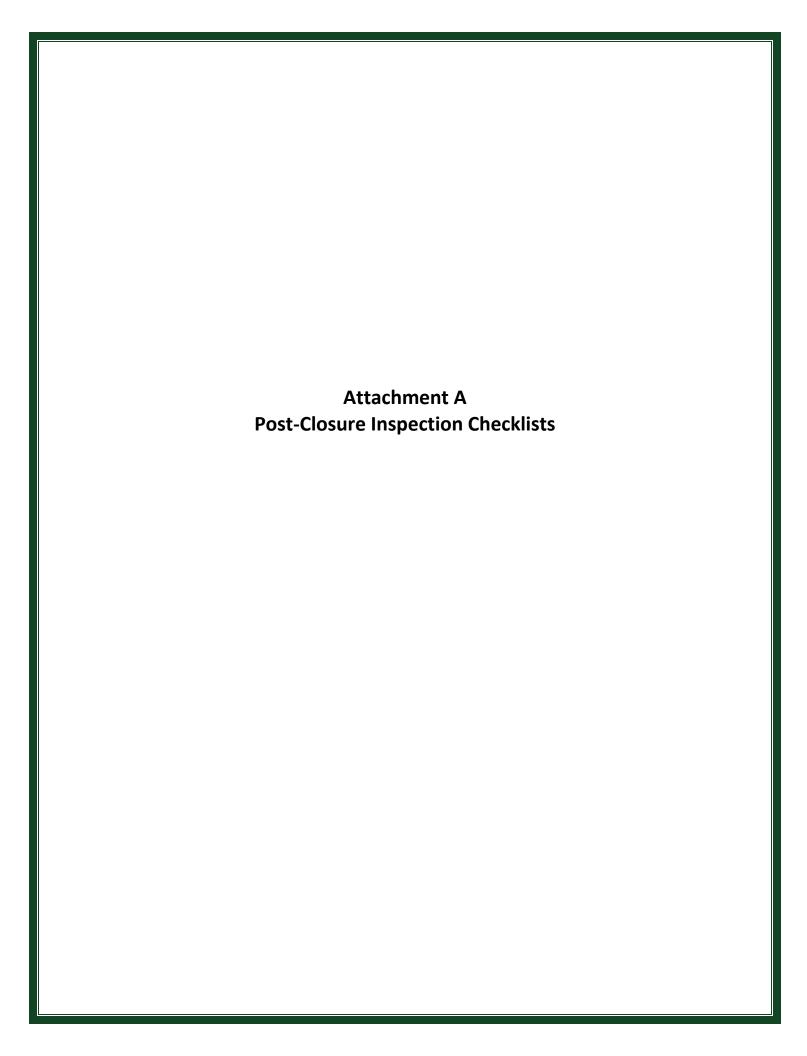
Landfill M11:

None detected

Landfill M13:

· None detected.

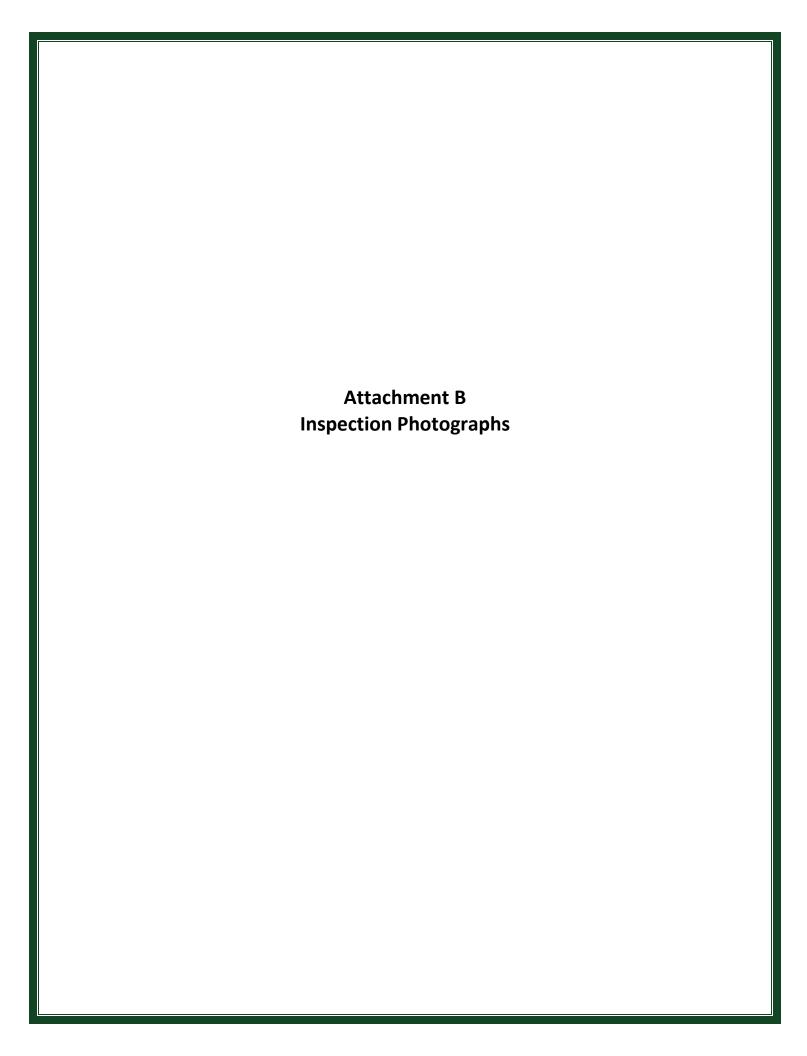




JOAAP LANDFILL INSPECTION CHECKLIST				
Landfill Designation: M11		Date of Inspection: March 1, 2012		
Inspected By: Gary Reside, TolTest Environmental Manager		Weather Conditions: Clear sky		
Names of those present at inspection:				
Checklist	Yes	No	Explanation	
Site Security				
a) Was fencing, gates and signs in good condition?	√ 			
b) Were gates locked?		$\sqrt{}$	Chained shut with no lock	
c) Evidence of trespassing		$\sqrt{}$		
Landfill Cover				
d) Evidence of Settling and/or Ponding?		V		
e) Any desiccation or cracking detected?		$\sqrt{}$		
f) Erosion around cap?		$\sqrt{}$		
g) Animal burrowing detected?		$\sqrt{}$		
Vegetation Condition				
h) Is vegetation well established?	√ V			
Evidence of vegetation detrimental to cap?		V		
Landfill structures				
j) Evidence of damage to monitoring wells?		$\sqrt{}$		
k) Evidence of damage to gas vents?		$\sqrt{}$		
Field Conclusions				
I) Is there an imminent hazard to the integrity of the unit?		V		
m) Are repairs necessary?		$\sqrt{}$		
Certification				
Inspector Signature:		Printed	Name: Gary Reside	
Gary Reside				
Title: Environmental Manager		Date: March 1, 2012		

JOAAP LANDFIL	L INSPEC	TION CH	IECKLIST		
Landfill Designation: L3		Date of Inspection: March 1, 2012			
Inspected By: Gary Reside, TolTest Environmental Manager			Weather Conditions: Clear sky		
Names of those present at inspection:					
Checklist	Yes	No	Explanation		
Site Security					
a) Was fencing, gates and signs in good condition?	V				
b) Were gates locked?	\checkmark				
c) Evidence of trespassing		V			
Landfill Cover					
d) Evidence of Settling and/or Ponding?		V			
e) Any desiccation or cracking detected?		$\sqrt{}$			
f) Erosion around cap?		V			
g) Animal Burrowing detected?		$\sqrt{}$			
Vegetation Condition					
h) Is vegetation well established?	$\sqrt{}$				
i) Evidence of vegetation detrimental to cap?		V			
Landfill structures					
j) Evidence of damage to monitoring wells?		V			
k) Evidence of damage to gas vents?		$\sqrt{}$			
Field Conclusions					
Is there an imminent hazard to the integrity of the unit?		V			
m) Are repairs necessary?	√		Rip Rap on West side needs repairs		
Certification					
Inspector Signature: Gary Reside		Printed	Name: Gary Reside		
Title: Environmental Manager		Date: March 1, 2012			

JOAAP LANDFILL INSPECTION CHECKLIST				
Landfill Designation: M13		Date of Inspection: March 1, 2012		
Inspected By: Gary Reside, TolTest Environmental Manager		Weather Conditions: Clear sky		
Names of those present at inspection:		l		
Checklist	Yes	No	Explanation	
Site Security	l	L		
a. Was fencing, gates and signs in good condition?	V			
b. Were gates locked?	$\sqrt{}$		New lock placed on gate.	
c. Evidence of trespassing		√		
Landfill Cover				
d. Evidence of Settling and/or Ponding?		√		
e. Any desiccation or cracking detected?		√		
f. Erosion around cap?		√		
g. Animal burrowing detected?		√		
Vegetation Condition		l		
h. Is vegetation well established?	V			
Evidence of vegetation detrimental to cap?		V		
Landfill structures				
j. Evidence of damage to monitoring wells?		√		
k. Evidence of damage to gas vents?		√		
Field Conclusions		l		
I. Is there an imminent hazard to the integrity of the unit?		V		
m. Are repairs necessary?		V		
Certification	-	•		
Inspector Signature:		Printed Name: Gary Reside		
Title: Environmental Manager		Date: March 1, 2012		





L3 West side looking South along Prairie Creek



L3 North side looking East



L3 East side looking South



L3 East side looking North



L3 South side looking West



M13 SW corner looking East



M13 locked gate



M13 NW corner looking SE



M13 top of cap looking SE



M13 top of cap looking East



M13 East side looking North



M11 South side looking NW



M11 SE corner looking North



M11 top of cap looking North.



M11 top of cap looking West.



M11 North side looking West.



M11 East side looking South

A2 - LANDFILL INSPECTION RE	PORT – APRIL 2012	

POST-CLOSURE INSPECTION REPORT FOR LANDFILLS L3, M11, AND M13

for the Performance-Based Acquisition of Environmental Remediation Services at Joliet Army Ammunition Plant Joliet, Illinois

April 2012

Submitted to:



US Army Contracting Agency
APG Directorate of Contracting - AEC Team
E4460 Beal Road, APG-EA, MD 21010

Contract Number: W91ZLK-05-D-0012
Delivery Order No. 0001

TolTest Project Number: 22271.01

Submitted by:



1480 Ford Street Maumee, OH 43537 (419) 794-3500

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

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for the 2008 Performance-Based Acquisition for Environmental			ental	5b. GRA	ANT NUM	BER
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TolTest, Inc.					REPORT N	UMBER
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Maumee, OH 44087						
9. SPONSORING/MONITO	RING AGE	NCY NAME(S) AN	ID		10. SPONS	OR/MONITOR'S
ADDESS(ES)					ACRONYN	
USAEC - Louisville District						CELRL-ED-EE
Aberdeen Proving Ground – W91ZLK					11. SPON	SOR/MONITOR'S REPORT
4118 Susquehanna Ave					NUMBER	
Aberdeen Proving Ground, M	D 21005-30	13				NA
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This Post-Closure Inspection rep						
the requirements of the Performa	nce-Based Co	ontract for Environme	ental R	emediati	on at the Joli	iet Army Ammunition Plant.
15. SUBJECT TERMS						
Landfill, Inspection Report, L3, M	111, M13					
16. SECURITY CLASSIFICATION	ON OF:	17. LIMITATION	18 NU	MBER C	OF PAGES	19a. NAME OF
		OF ABSTRACT				RESPONSIBLE PERSON
a. REPORT b. ABSTRACT c. TH	IIS PAGE					19b. TELEPHONE
						NUMBER (Include area code)
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Standard Form 298 (Rev. 8/98)

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POST-CLOSURE INSPECTION REPORT FOR LANDFILLS L3, M11, AND M13

for the Performance-Based Acquisition of Environmental Remediation Services at Joliet Army Ammunition Plant Joliet, Illinois

Submitted to:



US Army Contracting Agency APG Directorate of Contracting - AEC Team E4460 Beal Road, APG-EA, MD 21010

Contract Number: W91ZLK-05-D-0012
Delivery Order No. 0001

TolTest Project Number: 22271.01

Submitted by:



1480 Ford Street Maumee, OH 43537 (419) 794-3500

April 2012

DOCUMENT DISTRIBUTION for the Post-Closure Inspection Report for Landfills L3, M11, and M13 for the Performance-Based Acquisition of Environmental Remediation Joliet Army Ammunition Plant Joliet, Illinois

Ousseizstion	Distribution		
Organization	Paper	Electronic	
Joliet Army Ammunition Plant	2	2	
Joliet Environmental Information Management System	0	1	
United States Army Environmental Command	1	2	
United States Army Corps of Engineers - Louisville District	0	2	

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LIST OF ACRONYMS

GMZ Ground Water Monitoring Zone			
IAC Illinois Administrative Code			
JOAAP Joliet Army Ammunition Plant			
L3 JOAAP Landfill L3			
M11 JOAAP Landfill M11			
M13 JOAAP Landfill M13			
RA Remedial Action			
RG Remedial Goal			
USAEC United States Army Environmental Command			



POST-CLOSURE INSPECTION REPORT

1.0 Introduction

This document has been prepared for the United States Army Environmental Command to provide documentation of the conditions of three landfills (L3, M11, and M13) located at the former Joliet Army Ammunition Plant (JOAAP).

Post-closure monitoring requirements for Landfills L3, M11 and M13 are mandated by Illinois Administrative Code (IAC) Title 5, Subtitle G, Chapter 1, Subchapter c, Part 724, Subpart G for a period of 30 years. Objectives include:

- Confirm that the landfill cap has controlled leaching so that water quality will not be threatened in the future;
- Ensure that the cap is maintained in a manner that will not increase infiltration in the future or otherwise allow waste to be exposed; and
- Keep survey points protected and visible to facilitate identification in the future.

1.1 Landfill Cover Maintenance

According to IAC, the Landfills L3, M11 and M13 covers will be inspected on a quarterly basis for:

- Depressions indicating subsidence or other deformations that could breach the cover;
- Erosion features;
- Growth of deep rooted vegetation or invasive species that would adversely affect evapotranspiration and/or erosion armoring; and
- Debris or blockage of drainage structures.

Any damages or changes noted will be repaired to comply with the final design specifications for the cover.

Site inspections were conducted on 18 April 2012 for landfill M13, M11 and L3. This report includes copies of the inspection checklist, photographs, recommendations, and conclusions. The Post-Closure Inspection Checklists are found in Attachment A, and Inspection Photographs are found in Attachment B.

2.0 Landfill Descriptions

2.1 Landfill L3

Landfill L3 is located on the western edge of the Site L3 GMZ on the east bank of Prairie Creek. The GMZ comprises approximately 50 acres used as a demolition area directly southwest of Site L2, of which the landfill occupies only 3.32 acres. The area of Landfill L3 was originally contaminated through import of contaminated fill. However, other waste and contaminated soil have been moved to the site as a part of the L3 RA in order to consolidate residual contamination into a smaller footprint. The remedy selected for the consolidated area along Prairie Creek was capping to form Landfill L3. Implementation of the remedy began in 2007 and was completed in 2008.

Landfill L3 is believed to contain metals and explosive residues that could continue to contaminate the underlying groundwater and migrate to Prairie Creek. Because the landfill is bordered by Prairie Creek, any contamination that infiltrates from the filled area would be expected to migrate to Prairie Creek and quickly be discharged as the groundwater flows upward into the surface water body.



2.1.1 Monitoring Locations

Both groundwater and surface water sample points are monitored at Landfill L3 during spring and fall sampling rounds as follows:

- Upgradient Locations
 - SW004 (Surface location where Prairie Creek first touches the L3 GMZ boundary and upstream of the storm water outfall, spring only).
- Downgradient Locations
 - MW410
 - MW412
 - MW630
 - MW631
 - MW633
 - SW777 (Surface water location in Prairie Creek near the L3 GMZ boundary)
 - SW557 (Surface water location in Prairie Creek just upstream of the landfill drainage swale discharge)
 - SW558 (Surface water location at the constructed drainage swale along the southwest side of the newly constructed landfill)

2.2 Landfill M11

Landfill M11 is located in the southwestern portion of the manufacturing side of JOAAP. The GMZ comprises approximately 133 acres. Site M11 was divided into two sections by School House Road and bordered on the west by West Patrol Road. M11 north encompassed approximately 10.5 acres of former gravel pits that were mined and filled with waste. M11 south, a former gravel pit, encompassed approximately 5.6 acres that was also mined and filled with waste. The remedy chosen for Landfill M11 was waste consolidation and capping. Implementation of the remedy began in 2006 and was completed in 2008.

The current conceptual site model is that Landfill M11 is believed to contain manganese and sulfate containing waste that could potentially contaminate underlying groundwater and migrate beyond the GMZ.

With the implementation of the RA at Site M11, it is anticipated that the landfill cap will prevent percolation of precipitation through waste consolidated in the landfill thus, preventing groundwater contamination.

2.2.1 Monitoring Locations

Groundwater sample points are monitored at Landfill M11 in fall as follows:

- Upgradient Locations
 - MW802
 - MW803
- Downgradient Locations



- MW333
- MW334
- MW335
- MW336
- MW804
- MW805

In April 2012 samples were collected from wells MW802, MW335, MW336, and MW805 only.

2.3 Landfill M13

Landfill M13 comprises approximately 106 acres of the central portion of the MFG Area known as the gravel pits. It lies north of the Tetryl Production Area, east of the TNT Ditch Complex, and west of the Acid Area. Disposal activities were confined to four discrete areas on the site, none of which extended beyond 12 acres in size. Historical records indicate landfill disposal took place in the Northern Gravel Pit during the period 1966 to 1984 and involved scrap metals, creosote-treated railroad ties, telephone poles, and construction/demolition debris. The three other pits received waste materials that do not appear to pose a threat to human health and the environment.

Soil in the vicinity of the Northern Gravel Pit had been found to contain beryllium, lead, and benzo(a)pyrene as COCs. Explosive compounds that have been observed in groundwater at Site M13 include: TNT, TNB, 2,4-DNT, and 2,6-DNT. On a single occasion in 1991, antimony and cadmium were reported to be present at concentrations in excess of their respective RGs, but they have not exceeded the RGs since then. It is difficult to determine if the original findings could have resulted from turbid samples since low flow sampling and micro purging techniques are now employed to obtain more representative samples.

The current conceptual site model is that metal and benzo(a) pyrene in groundwater may be present as a result of leaching of waste materials in the Northern Gravel Pit. The explosives present in groundwater are far more likely to be present due to infiltration of wastewater in the TNT Ditch. There is no evidence to suggest explosive compounds were ever present in waste materials put into the pit.

With the implementation of the RA on the TNT Ditch and the capping of the Northern Gravel Pit, it is anticipated that contaminants in site groundwater will detach from the source areas and migrate as legacy plumes to the west. As such, concentrations are expected to decline with time.

2.3.1 Monitoring Locations

Groundwater is monitored quarterly through sample collection and analysis at six monitoring wells:

- Upgradient or background wells
 - MW806
 - MW807
- Cross Gradient
 - MW126R
 - MW362



- Downgradient or source control wells
 - MW808
 - MW809

3.0 Inspection Results

The following are the observations from the landfill inspections conducted at L3, M11, and M13 on 18 April 2012.

3.1 Landfill L3

The perimeter fence and site postings were in good condition. The vegetative cover was well established and no erosion was observed. All woody plants observed on the landfill cap during the inspection were cut and removed. No subsidence was observed nor was there any evidence of damage due to burrowing animals.

The rip rap along Prairie Creek at Site L3 has been washed away at several locations and is in need of repair. Although small areas of the synthetic cap is exposed at several locations as a result of the rip rap being washed away, the landfill appears to be stable and does not appear to be failing. The remaining rip rap also appears to be stable.

3.2 Landfill M11

The perimeter fence, gate and site postings were in good condition. The vegetative cover was well established and no erosion was observed. All woody plants observed on the landfill cap during the inspection were cut and removed. The rip rap along the perimeter was evenly applied and no erosion channels were detected. There was no evidence of damage due to burrowing animals. The vents were undamaged and appeared to be in working order.

3.3 Landfill M13

The perimeter fence, gate and site postings were in good condition. The vegetative cover was well established and no erosion was observed. All woody plants observed on the landfill cap during the inspection were cut and removed. The rip rap along the perimeter was evenly applied and no erosion channels were detected. The vents were undamaged and appeared to be in working order.

4.0 Conclusions and Recommendations

The deficiencies noted within this report which need to be addressed include the following:

Landfill L3:

- Repair rip rap along Prairie creek. The Army is currently preparing the contract documentation necessary for implementation of the repairs.
- Some woody plants were observed on the landfill cap during the inspection and were cut and removed.

Landfill M11:

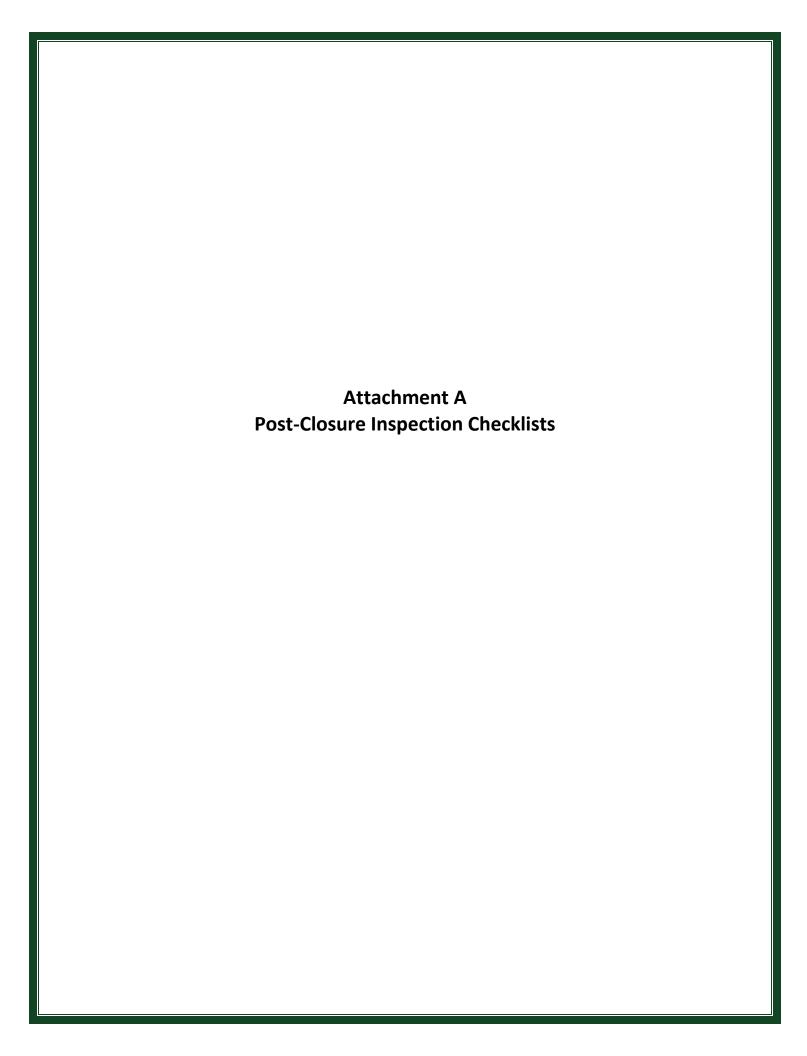
 Some woody plants were observed on the landfill cap during the inspection and were cut and removed.

Landfill M13:





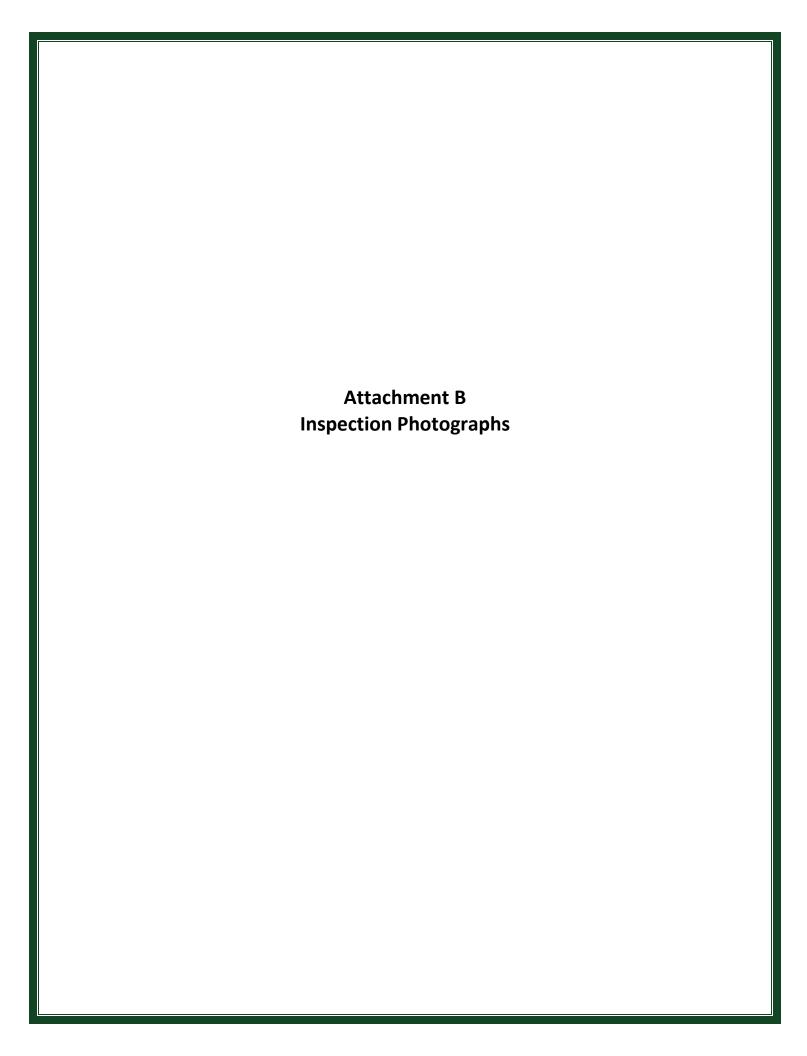
Project No. 22271.01



JOAAP LANDFILL INSPECTION CHECKLIST					
Landfill Designation: M11			Date of Inspection: April 18, 2012		
Inspected By: Gary Reside, TolTest Environmental Manager		Weather Conditions: Clear sky			
Names of those present at inspection:					
Checklist Yes		No	Explanation		
Site Security					
a) Was fencing, gates and signs in good condition?	V				
b) Were gates locked?		V	Chained shut with no lock		
c) Evidence of trespassing		$\sqrt{}$			
Landfill Cover					
d) Evidence of Settling and/or Ponding?		V			
e) Any desiccation or cracking detected?		V			
f) Erosion around cap?		V			
g) Animal burrowing detected?		V			
Vegetation Condition					
h) Is vegetation well established?	√				
i) Evidence of vegetation detrimental to			All woody plants observed on the landfill cap during the inspection were cut and removed.		
Landfill structures	l				
j) Evidence of damage to monitoring wells?		V			
k) Evidence of damage to gas vents?		V			
Field Conclusions			<u> </u>		
Is there an imminent hazard to the integrity of the unit?		V			
m) Are repairs necessary?		V			
Certification					
Inspector Signature:		Printed	Name: Gary Reside		
Gary Reside					
Title: Environmental Manager		Date: April 18, 2012			

JOAAP LANDFILL INSPECTION CHECKLIST					
Landfill Designation: L3			Date of Inspection: April 18, 2012		
Inspected By: Gary Reside, TolTest Environmental Manager			Weather Conditions: Clear sky		
Names of those present at inspection:					
Checklist Yes			Explanation		
Site Security					
a) Was fencing, gates and signs in good condition?	V				
b) Were gates locked?	$\sqrt{}$				
c) Evidence of trespassing		$\sqrt{}$			
Landfill Cover					
d) Evidence of Settling and/or Ponding?		$\sqrt{}$			
e) Any desiccation or cracking detected?		V			
f) Erosion around cap?		V			
g) Animal Burrowing detected?		V			
Vegetation Condition	1				
h) Is vegetation well established?	$\sqrt{}$				
i) Evidence of vegetation detrimental to cap?			All woody plants observed on the landfill cap during the inspection were cut and removed.		
Landfill structures					
j) Evidence of damage to monitoring wells?		V			
k) Evidence of damage to gas vents?		V			
Field Conclusions					
Is there an imminent hazard to the integrity of the unit?		V			
m) Are repairs necessary?	V		Rip Rap on West side needs repairs		
Certification					
Inspector Signature: Gary Reside			Printed Name: Gary Reside		
Title: Environmental Manager			Date: April 18, 2012		

JOAAP LANDFILL INSPECTION CHECKLIST					
Landfill Designation: M13			Date of Inspection: April 18, 2012		
Inspected By: Gary Reside, TolTest Environmental Manager			Weather Conditions: Clear sky		
Names of those present at inspection:					
Checklist Yes		No	Explanation		
Site Security					
a. Was fencing, gates and signs in good condition?	V				
b. Were gates locked?	√		New lock placed on gate.		
c. Evidence of trespassing		$\sqrt{}$			
Landfill Cover					
d. Evidence of Settling and/or Ponding?		V			
e. Any desiccation or cracking detected?		V			
f. Erosion around cap?		$\sqrt{}$			
g. Animal burrowing detected?		V			
Vegetation Condition	L				
h. Is vegetation well established?	V				
i. Evidence of vegetation detrimental to			All woody plants observed on the landfill cap during the inspection were cut and removed.		
Landfill structures	L				
j. Evidence of damage to monitoring wells?		V			
k. Evidence of damage to gas vents?		V			
Field Conclusions					
Is there an imminent hazard to the integrity of the unit?		V			
m. Are repairs necessary?		$\sqrt{}$			
Certification					
Inspector Signature:		Printed Name: Gary Reside			
Title: Environmental Manager		Date: April 18, 2012			





L3 West side looking South.



L3 North side looking East



L3 East side of landfill



L3 East side of landfill



M11 South side looking North.



M11 West side looking Northeast.



M11 West side looking North.



M11 Top of cap looking North.



M11 East side looking North.



M13 Top of cap looking East.



M13 East side looking South.



M13 East side looking North.



M13 South side looking East.

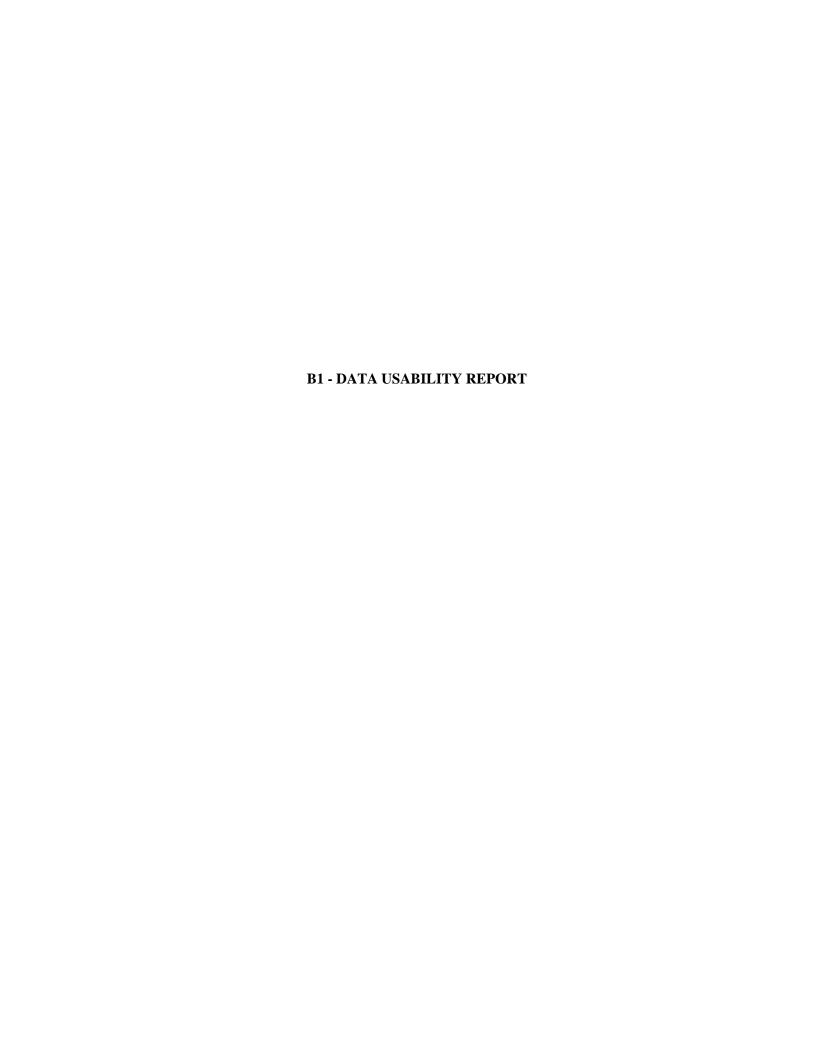


M13 South side looking West.

APPENDIX B

DATA REPORTS

- **B1 DATA USABILITY REPORT**
- B2 DATA VALIDATION REPORTS LABORATORY DATA CONSULTANTS (LDC)



APPENDIX B1

DATA USABILITY REPORT GROUNDWATER AND SURFACE WATER SAMPLING FEBRUARY AND APRIL 2012

JOLIET ARMY AMMUNITION PLANT WILL COUNTY, ILLINOIS

Submitted to:



US Army Contracting Agency APG Directorate of Contracting – AEC Team E4460 Beal Road, APG-EA, MD 21010

Contract Number: W91ZLK-05-D-0012

TolTest Project Number: 22271.01

Submitted by:



1480 Ford Street Maumee, OH 43537 (419) 794-3500

April 2013

DATA USABILITY REPORT

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ACRONYMS AND ABBREVIATIONS

%D percent difference %R percent recovery

CCB continuing calibration blank
CCV continuing calibration verification
GC/MS gas chromatography/mass spectroscopy

ICAL initial calibration

ICB initial calibration blank
ICS interference check sample
ICV initial calibration verification

J estimated value

JOAAP Joliet Army Ammunition Plant

LCS/LCSD laboratory control sample/laboratory control sample duplicate

LDC Laboratory Data Consultants
MD matrix duplicate (metals)
mg/L milligrams per liter
MRL method reporting limit

MS/MSD matrix spike/matrix spike duplicate

MWH Americas, Inc.

ORP oxidation/reduction potential

QA quality assurance QC quality control

R analytical result is unusable RPD relative percent difference SDG sample delivery group

SVOCs semivolatile organic compounds

TAL target analyte list

Test America Test America Laboratories, Inc.

ug/L micrograms per liter

U analyte analyzed for but not detected

UJ analyte is not detected estimated quantitation limit USEPA United States Environmental Protection Agency

VOCs volatile organic compounds

CRS\BTZ\RJR

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APPENDIX B1

DATA USABILITY SUMMARY

1.0 INTRODUCTION

The following data usability summary discusses quality assurance/quality control (QA/QC) outliers for each analyte group per sampling round. Data qualifiers were added to results and imported into the Joliet Army Ammunition Plant (JOAAP) database. Data qualifiers used in the validation process may include the following:

- U Not detected. This validation qualifier was added if there was blank contamination and the sample concentration was less than five times the blank concentration (ten times for common organic contaminants methylene chloride, acetone, phthalates)
- \bullet J Estimated value. This validation qualifier was added if the reported concentration is estimated.
- UJ Not detected, estimated quantitation limit. This validation qualifier was added if the analyte was not detected but QA/QC parameters were not met.
- R Unusable data. This validation qualifier was added if the analyte was not detected but QA/QC parameters were not met and were extremely low (i.e. less than 10% recovery for laboratory control samples (LCS) or surrogate recoveries)

Test America Laboratories, Inc. (Test America) located at 2417 Bond Street, University Park, Illinois performed the analyses of groundwater and surface water samples collected in February and April 2012 at the JOAAP located in Wilmington, Illinois. Groundwater was collected from site M13 Landfill and analyzed for the following parameters in February 2012:

- Volatile organic compounds (VOCs) were analyzed by SW846 Method 8260B.
- Semivolatile organic compounds (SVOCs) were analyzed by SW846 Method 8270C.
- Explosives were analyzed by SW846 Method 8330.
- Target analyte list (TAL) metals were analyzed by SW846 Methods 6010B and 7470A (mercury).
- Sulfate was analyzed by United States Environmental Protection Agency (USEPA) Method 300.0.
- Nitrate was analyzed by USEPA Method 300.0.

Groundwater was collected from nine sites and analyzed for the following parameters in April 2012:

• VOCs were analyzed by SW846 Method 8260B at Sites M3, M11 Landfill and M13 Landfill.

- SVOCs were analyzed by SW846 Method 8270C at Sites M11 Landfill and M13 Landfill.
- Explosives were analyzed by SW846 Method 8330 at Sites M5, M6, M7, L1, L2, L3, L14, OA, L3 Landfill, M11 Landfill, and M13 Landfill.
- TAL metals were analyzed by SW846 Methods 6010B and 7470A at Sites L2, L3, L3 Landfill, M11 Landfill, and M13 Landfill.
- Sulfate was analyzed by USEPA Method 300.0 at Sites M1, M8, M9, M11 Landfill and M13 Landfill.
- Nitrate was analyzed by USEPA Method 300.0 at Sites M11 Landfill and M13 Landfill.

Surface water was collected from three sites at JOAAP and analyzed for the following parameters:

- Explosives were analyzed by SW846 Method 8330 at Sites L1, L2, L3, and L3 Landfill.
- TAL metals were analyzed by SW846 Methods 6010B and 7470A at Sites L1 and L3 Landfill.
- Sulfate was analyzed by USEPA Method 300.0 at Site M1.

Field parameters are not discussed in this data usability report, but were recorded by field personnel with a water quality meter at the time of sample collection and included:

• pH, temperature, specific conductivity, dissolved oxygen, turbidity, and oxidation/reduction potential (ORP)

The following summarizes the sample delivery group (SDG) and corresponding data validation report:

Sample Delivery Group	Data Validation	Associated Samples
	Report Number	
500-44539-1	27391	JP-M13-GWMW126R
		JP-M13-GWMW362
		JP-M13-GWMW806
		JP-M13-GWMW807
		JP-M13-GWMW808
		JP-M13-GWMW809
		JP-M13-GWMW999
500-44555-1	27391	JP-M13-GWAEHA14R
		JP-M13-GWAEHA15
500-45420-1	27595	JP-L1-GWMW173-0412
		JP-L1-GWMW174-0412
		JP-L1-GWMWWES3-0412
		JP-L3-GWMW410-0412
		JP-L3-GWMW412-0412
		JP-L3-GWMW630-0412

Sample Delivery Group	Data Validation Report Number	Associated Samples
		JP-L3-GWMW631-0412
		JP-L3-GWMW633-0412
		JP-L3-GWMW999-0412
		JP-L3-SW557-0412
		JP-L3-SW558-0412
		JP-L3-SW777-0412
500-45457-1	27605	JP-L3-SW004-0412
		JP-M1-GWMW648-0412
		JP-M1-GWMW998-0412
		JP-M1-GWMW641-0412
		JP-M1-GWMW997-0412
		JP-M1-GWMW642-0412
		JP-M1-GWMW640-0412
		JP-M1-GWMW107-0412
		JP-M1-GWMW231-0412
		JP-M1-GWMW645-0412
		JP-M1-GWMW646
		JP-M1-GWMW649
		JP-M1-GWMW644
		JP-M1-GWMW643
		JP-M1-SW709
		JP-L1-GWMW131
		JP-L1-GWWES1
		JP-L1-SW550
		JP-OA-GWMW118
		JP-OA-GWMW119
		JP-OA-GWMW117
500-45518-1	27469	JP-M13-GWMW126R
		JP-M13-GWMW362
		JP-M13-GWMW806
		JP-M13-GWMW807
		JP-M13-GWMW808
		JP-M13-GWMW809
		JP-M13-GWMW999
500-45519-1	27649	JP-M06-GWMW654
		JP-M11-GWMW335
		JP-M11-GWMW336
		JP-M11-GWMW802
		JP-M11-GWMW805
		JP-M9-GWMW330
500-45521-1	27649	JP-M06-GWMW123R
		JP-M06-GWMW162R
		JP-M06-GWMW212R

Sample Delivery Group	Data Validation	Associated Samples
	Report Number	
		JP-M06-GWMW313
		JP-M06-GWMW318
		JP-M06-GWMW319
		JP-M06-GWMW652
		JP-M06-GWMW994
		JP-M06-GWMW995
		JP-M07-GWMW124R

2.0 LABORATORY QA/QC ELEMENTS

Laboratory Data Consultants, Inc. (LDC) located at 7750 El Camino Real, Suite 2L, Carlsbad, California performed the equivalent of USEPA Level III validation on 100% of the data using the JOAAP Quality Assurance Project Plan (QAPP) for Long Term Monitoring, a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, and the Department of Defense Quality Systems Manual for Environmental Laboratories validation guidelines, as appropriate. QAPP Worksheets # 34, #35, and #36 describe the verification process and QAPP Worksheet #37 describes the data usability assessment.

Data were evaluated for precision, accuracy, representativeness, comparability, and completeness based on results of the following QA/QC samples and parameters, where applicable:

- Sample preservation
- Sample holding times
- Surrogate spikes (organics)
- Laboratory control sample (LCS/LCSD)
- Matrix spike/matrix spike duplicate (MS/MSD)
- Matrix duplicate (MD) for metals
- Laboratory duplicate samples
- Gas chromatography/mass spectroscopy (GC/MS) tunes (organics)
- Internal standards (organics)
- Initial calibration (ICAL) standards
- Initial calibration verification (ICV) standards
- Continuing calibration verification (CCV) standards
- Interference check samples (ICSs) (metals)
- Trip blanks (VOCs)
- Serial dilution (metals)
- Method blanks
- Initial calibration blanks (ICBs)
- Continuing calibration blanks (CCBs)

The following field QA/QC samples were collected and analyzed:

- One field duplicate per 10 field samples collected
- One MS/MSD (extra sample volume) per 20 field samples collected
- Trip blanks included with each cooler containing VOC samples.

Samples were stored in coolers on wet ice, transported, and hand delivered to the analytical laboratory under chain-of-custody documentation.

3.0 EVALUATION OF MEASUREMENT QUALITY OBJECTIVES

For each analytical method, laboratory QA/QC results were compared to the established acceptance limits. The parameters reviewed for each are outlined in the following subsections.

3.1 PRECISION

Precision was quantitatively evaluated by reviewing the relative percent differences (RPDs) for the following QA/QC samples:

- MS/MSDs
- Matrix duplicate (metals)
- LCS/LCSDs
- Laboratory duplicate samples
- Serial dilution (metals)
- Field duplicate samples

Refer to Worksheet #12 (Method Performance Criteria Table) and Worksheet #28 (QC Samples Table) for QC samples analyzed and criteria limits.

3.1.1 February 2012

VOCs – VOCs precision QA/QC were acceptable.

SVOCs – SVOCs precision QA/QC were acceptable with the exception of the LCS/LCSD RPD for benzidine (27%), benzoic acid (116%), 2-nitroaniline (25%), and 4-nitrophenol (27%) were outside the acceptable limit and was qualified "UJ" as not detected, estimated quantitation limit in sample JP-M13-GWMWAEHA14R.

Explosives – Explosives precision QA/QC were acceptable.

TAL Metals – TAL metals precision QA/QC were acceptable with the exception of the serial dilution in sample M13LMWAEHA14R for potassium (12%). Potassium was qualified "J" as estimated in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999

Sulfate – Sulfate precision QA/QC were acceptable.

Nitrate – Nitrate precision QA/QC were acceptable.

3.1.2 April 2012

VOCs – VOCs precision QA/QC were acceptable.

SVOCs – SVOCs precision QA/QC were acceptable with the exception of the MS/MSD (JP-M13-GWMW126R) RPD for n-nitrosodimethylamine (65%) and benzoic acid (32%). N-nitrosodimethylamine and benzoic acid were not detected in the subject sample, therefore, no qualifiers were added to the data.

The ICV %RSDs were outside the acceptable limit for the following compounds:

- N-nitrosodimethylamine (33.0%)
- 3&4-methylphenol (19.0%)
- dibenzofuran (17.0%)
- Di-n-butylphthalate (17.0%)
- Benzo(k)fluoranthene (22.0%)

If the above listed compound was detected in a sample listed below, it was qualified "J" as estimated.

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999
- JP-M11-GWMW335
- JP-M11-GWMW802
- JP-M11-GWMW805

The ICV %RSDs associated with sample JP-M11-GWMW336 were outside the acceptable limit for the following compounds:

- Benzoic acid (55.0%)
- 2,4-dinitrophenol (19.0%)

If detected, the compound was qualified "J" as estimated.

Explosives – Explosives precision QA/QC were acceptable with the following exceptions discussed below.

The difference between detected results between parent sample JP-M13-GWMW362 and duplicate sample JP-M13-GWMW999 were greater than the acceptable limits for

2-nitrotoluene (1.76 micrograms per liter [ug/L]) and 4-nitrotoluene (1.59 ug/L). Detections of these compounds for these two samples were flagged as "J" for estimated.

TAL Metals – TAL metals precision QA/QC were acceptable.

Sulfate – Sulfate precision QA/QC were acceptable.

Nitrate – Nitrate precision QA/QC were acceptable.

3.2 ACCURACY

Accuracy was quantitatively evaluated by comparing the percent recovery (%R) or percent difference (%D) for the following QA/QC samples or parameters:

- Surrogate spikes (VOCs and SVOCs)
- Internal standards (VOCs and SVOCs)
- ICVs
- CCVs
- MS/MSDs
- LCSs
- ICSs (metals)

Refer to Worksheet #12 (Method Performance Criteria Table) and Worksheet #28 (QC Samples Table) for QC samples analyzed and criteria limits.

3.2.1 February 2012

VOCs – The CCV %D was outside the acceptable limit for 2-butanone (24.9%), trans-1,3-dichloropropene (22.5%), 2-hexanone (34.4%), hexachlorobutadiene (28.5%), and 1,2,3-trichlorobenzene (32.3%). These compounds were not detected and were qualified "UJ" as not detected, estimated quantitation limit in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999
- Trip Blank

The CCV %D was outside the acceptable limit for dichlorodifluoromethane (25.8%), vinyl acetate (20.3%), cis-1,3-dichloropropene (27.3%), 4-methyl-2-pentanone (26.8%), 1,1,1-trichloroethane (32.9%), 1,1,2-trichloroethane (22.5%), 2-hexanone (29.6%), 1,2-dibromomethane (24.6%), 1,1,2,2-tetrachloroethane (21.9%), n-propylbenzene (23.5%), hexachlorobutadiene (30.6%), and 1,2,3-trichlorobenzene (32.5%). These

compounds were not detected and were qualified "UJ" as not detected, estimated quantitation limit in the following samples:

- JP-M13-GWAEHA14R
- JP-M13-GWAEHA15

The second source calibration standard %Ds were outside the acceptable limit for chloromethane (21.7%) and dichlorodifluoromethane (27.6%). These compounds were not detected and were qualified "UJ" as not detected, estimated quantitation limit in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999
- Trip Blank
- JP-M13-GWAEHA14R
- JP-M13-GWAEHA15

The MS/MSD (JP-M13-GWMW808) %Rs were outside acceptable limits for the following compounds:

- Vinyl acetate (123% MS)
- 2-hexanone (131% MSD)
- 1,1,2-trichloroethane (131%, 129%)

These compounds were not detected and therefore qualification was not required..

The LCS %R for 1,1,2-trichloroethane (129%) was above the acceptable limit. This compound (1,1,2-trichloroethane) was not detected in the associated samples, therefore qualification was not necessary.

The LCS %R for vinyl acetate (125%) was above the acceptable limit. Vinyl acetate was not detected in associated samples and no qualifiers were added to the data.

SVOCs – The CCV %Ds were outside the acceptable limits for the following compounds:

- 4-chlorophenyl-phenyl ether (20.2%)
- 2,4-dimethylphenol (21.5%)
- 2-methylnaphthalene (23.4%)
- 2,4,6-trichlorophenol (22.2%)
- 2-chloronaphthalene (20.6%)
- Acenaphthene (20.5%)

- 2,4-dinitrophenol (25.8%)
- 4-nitrophenol (20.5%)
- Fluorine (22.1%)
- N-nitrosodiphenylamine (23.8%)
- Hexachlorobenzene (24.0%)
- Phenanthrene (21.9%)
- Anthracene (21.7%)
- Carbazole (20.5%)
- Benzo(a)anthracene (21.8%)

These compounds were not detected and therefore were qualified "UJ" as not detected, estimated quantitation limit, in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999
- Trip Blank
- JP-M13-GWAEHA14R
- JP-M13-GWAEHA15

The ICV %D was outside the acceptable limit for 3&4-methylphenol (17.0%), benzoic acid (25.0%), fluorine (16.0%), butylbenzylphthalate (18.0%), bis(2-ethylhexyl)phthalate (20.0%), and benzo(k)fluoranthene (19.0%). None of these compounds were detected and were qualified "UJ" as not detected, estimated quantitation limit in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999
- Trip Blank
- JP-M13-GWAEHA14R
- JP-M13-GWAEHA15

The second source calibration standard %Ds were outside the acceptable limit for bis(2-chloroethyl)ether (25.5%). This compound was not detected and was qualified "UJ" as not detected, estimated quantitation limit, in the following samples:

- JP-M13-GWAEHA14R
- JP-M13-GWAEHA15

The MS/MSD %Rs were outside the acceptable limits for the following compounds:

- Benzo(a)pyrene (116% MS, 120% MSD)
- Di-n-octylphthalate (141% MSD)

These compounds were not detected and were qualified "UJ" as not detected, estimated quantitation limit in the associated sample JP-M13-GWMW808.

The surrogate spike %R recoveries were all acceptable with the exception of 2-fluorophenol (3%), phenol-d5 (7%), nitrobenzene (5%), and 2-fluorophenol (38%) associated with SDG 500-44555-1 in sample JP-M13-GWAEHA14R. All detected compounds associated with these surrogates were qualified as R and non-detect results were flagged as "J" in the following associated samples. However, this sample were rerun and surrogate recoveries were acceptable. As a result, the re-run analyses were reported as estimated.

Internal standard areas and retention times were acceptable.

Explosives – Explosives accuracy QA/QC were acceptable with the following exceptions.

The MS/MSD %Rs were outside the acceptable limits for the following compounds:

- HMX (133% MS, 134% MSD)
- 1,3,5-Trinotrobenzene (142% MS)
- 4-Nitrotoluene (137% MS, 137% MSD)

These compounds, associated with sample JP-M13-GWMW808, were not detected and no qualifiers were necessary.

TAL Metals – TAL Metals accuracy QA/QC were acceptable

Sulfate – Sulfate accuracy QA/QC were acceptable

Nitrate – Nitrate accuracy QA/QC were acceptable.

3.2.2 April 2012

VOCs - The %Ds in the CCV were outside the acceptable limit for the following compounds:

• Isopropylbenzene (20.4%)

Isopropylbenzene was not detected and was qualified "UJ" as not detected, estimated quantitation limit, in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999
- JP-M11-GWMW335
- JP-M11-GWMW336
- JP-M11-GWMW802JP-M11-GWMW805
- Trip Blanks

SVOCs - The %Ds in the CCV were outside the acceptable limit for the following compounds:

- 2-methylnaphthalene (20.3%)
- dibenzofuran (21.3%)
- Di-n-butylphthalate (20.5%)

The above compounds were not detected and were qualified "UJ" as not detected, estimated quantitation limit, in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999

The %Ds in the CCV were outside the acceptable limit for the following compounds:

- N-nitrosodimethylamine (41.8%)
- Benzoic acid (44.4%)
- 2,4-dinitrophenol (32.5%)
- 4-nitrophenol (25.6%)

The above compounds were not detected and were qualified "UJ" as not detected, estimated quantitation limit, in the following samples:

• JP-M11-GWMW336

The second source calibration standard %Ds were outside the acceptable limit for 2-methylnaphthalene (20.3%), dibenzofuran (21.3%), and di-n-butylphthalate (20.5%). These compounds were not detected and were qualified "UJ" as not detected, estimated quantitation limit in the following samples:

- JP-M11-GWMW802
- JP-M11-GWMW805
- JP-M11-GWMW335

The second source calibration standard %Ds was outside the acceptable limit for benzoic acid (125.4%). This compound was not detected and was qualified "UJ" as not detected, estimated quantitation limit, in the following samples:

JP-M11-GWMW336

Explosives – The CCV %D for n-nitrotoluene (17.5%) was outside the acceptable limits. When not detected, n-nitrotoluene was qualified "UJ" and "J" for detected results in the following samples associated with SDG 500-45457-1:

- JP-OA-GWMW118
- JP-OA-GWMW119
- JP-OA-GWMW117

The CCV %D for 2,4,6-trinitrotoluene (16.6%) was outside the acceptable limits. Non-detect sample results were qualified "UJ" and samples with detection were qualified "J" in the following sample associated with SDG 500-45518-1 and 500-45519-1:

- JP-M13-GWMW807
- JP-M06-GWMW654
- JP-M11-GWMW335
- JP-M11-GWMW336
- JP-M11-GWMW802
- JP-M11-GWMW805

The LCS %R for HMX (116%) was above the acceptable limit. HMX detections were flagged with "J" for the following samples were detected:

- JP-L1-GWMW173-0412
- JP-L1-GWMW174-0412
- JP-L1-GWMWWES3-0412
- JP-L3-GWMW410-0412
- JP-L3-GWMW412-0412
- JP-L3-GWMW630-0412
- JP-L3-GWMW631-0412
- JP-L3-GWMW633-0412
- JP-L3-GWMW999-0412
- JP-L3-SW557-0412
- JP-L3-SW558-0412
- JP-L3-SW777-0412
- JP-L1-GWMW131
- JP-L1-GWWES1

- JP-L1-SW550
- JP-OA-GWMW118
- JP-OA-GWMW119
- JP-OA-GWMW117
- JP-L3-SW004-0412

The %D between the duel columns for samples with detections were outside of the acceptance criteria for 4-amino-2.6-dinotrotoluene (47.9%) and 2-amino-4,6-dintrotoluene (53.3%) associated with sample JP-L3-GWMW630-0412, 4-amino-2.6-dinotrotoluene (61.7%) and 2-amino-4,6-dintrotoluene (58.1%) associated with sample JP-L3-GWMW999-0412, and 1,3,5-trinitrobenzene (51.3%) associated with sample JP-L3-GWMW412-0412 for SDG 500-45420-1.

The %D between the duel columns for samples with detections were outside of the acceptance criteria for 1.3-dinitrobenzene (130.0%) associated with sample JP-L1-GWMW131 and 4-amino-2.6-dinotrotoluene (63.5%) and 1,3,5-trinitrobenzene (189.8%) associated with sample JP-L1-GWWES1 for SDG 500-45457-1.

The %D between the duel columns for samples with detections was outside of the acceptance criteria for 2-nitrotoluene (79.0%) associated with sample JP-M13-GWMW362 for SDG 500-45518-1.

The %D between the duel columns for samples were outside of the acceptance criteria for RDX (182.3%) and 3-nitrotoluene (149.1%) associated with sample JP-M06-MWGW654 for SDG 500-45519-1.

The %D between the duel columns for samples were outside of the acceptance criteria for the following associated with SDG 500-45521-1:

- 2,4-dinitrotoluene (113.0%) associated with sample JP-M06-MWGW162R
- 4-amino-2.6-dinotrotoluene (61.5%) and 2-amino-4,6-dintrotoluene (60.2%) associated with sample JP-M06-MWGW212R
- 2,6-dinitrotoluene (146.1%) and 2,4-dinitrotoluene (176.1%) associated with sample JP-M06-MWGW318
- 2,4,6-trinitrotoluene (129.6%) associated with sample JP-M06-MWGW319
- 4-amino-2.6-dinotrotoluene (67.5%) associated with sample JP-M06-GWMW652
- 4-amino-2.6-dinotrotoluene (71.9%) and 4-nitrotoluene (57.2%) associated with sample JP-M06-GWMW994

All detections associated with these compounds and samples above were qualified with "J".

The surrogate spike %R recoveries were all acceptable with the exception of 1,2-dinitrobenzene (201%). All detected compounds associated with the following compounds were qualified as "J":

• JP-M06-GWMW318

TAL Metals – The MSD (JP-M13-GWMW126R) %R for magnesium (70%), sodium (76%), and mercury (77%) were less than the acceptable limits. These metals were qualified "J" as estimated for detections and UJ for non-detects in the following samples:

- JP-M13-GWMW126R
- JP-M13-GWMW362
- JP-M13-GWMW806
- JP-M13-GWMW807
- JP-M13-GWMW808
- JP-M13-GWMW809
- JP-M13-GWMW999

Sulfate - Sulfate accuracy QA/QC were acceptable.

Nitrate – Nitrate accuracy QA/QC were acceptable.

Accuracy was also quantitatively evaluated by reviewing concentrations of the following QA/QC samples:

- ICBs
- CCBs
- Method blanks
- Trip blanks

3.2.3 February 2012

VOCs – VOCs were not detected in associated blanks.

SVOCs – SVOCs were not detected in associated blanks.

Explosives – Explosives were not detected in associated blanks.

TAL Metals – The following metals were detected in method blanks, ICBs, or CCBs:

- antimony (0.00357 milligrams per liter [mg/L])
- barium (0.000520 mg/L and 0.0664 mg/L)
- lead (0.00175 mg/L and 0.0032 mg/L)

Antimony was qualified "U" as not detected at the reported concentration in the following samples:

- JP-M13-GWMW362 (0.0035 U)
- JP-M13-GWMW807 (0.0030 U)

- JP-M13-GWMW809 (0.0028 U)
- JP-M13-GWMW999 (0.0031 U)
- JP-M13-GWMW808 (0.0033 U)

Lead was qualified "U" as not detected at the reported concentration in the following samples:

- JP-M13-GWMW362 (0.0016 U)
- JP-M13-GWMW126R (0.0016 U)
- JP-M13-GWMW999 (0.0016 U)
- JP-M13-GWMW807 (0.0017 U)

Qualifiers were not added to the data for barium because either the sample concentration was greater than five times the blank concentration or the analyte was not detected.

Sulfate – Sulfate was detected in the following blanks:

• ICB/CCB (0.0976 mg/L)

Sulfate was not qualified based on blank contamination because all sample concentrations were greater than five times the blank concentration or sulfate was not detected.

Nitrate – Nitrate was not detected in associated blanks.

3.2.4 April 2012

VOCs – VOCs were not detected in associated blanks.

SVOCs – SVOCs were not detected in associated blanks.

Explosives – Explosives were not detected in associated blanks.

TAL Metals – The following metals were detected in method blanks, ICBs, or CCBs:

• copper (0.00549 mg/L)

Copper was qualified "U" as not detected at the reported concentration in the following samples:

- JP-L3-GWMW412-0412 (0.026U)
- JP-L3-GWMW630-0412 (0.027U)
- JP-L3-GWMW631-0412 (0.015U)
- JP-L3-GWMW633-0412 (0.023U)
- JP-L3-GWMW999-0412 (0.020U)
- JP-L3-SW557-0412 (0.023U)

- JP-L3-SW558-0412 (0.0066U)
- JP-L3-SW777-0412 (0.0041U)

The following metals were detected in method blanks, ICBs, or CCBs:

- copper (0.00557 mg/L)
- calcium (0.100 mg/L)
- zinc (0.00582 mg/L)

Copper was qualified "U" as not detected at the reported concentration in the following samples:

• JP-L3-SW004-0412 (0.018U)

Sulfate – Sulfate was not detected in associated blanks.

Nitrate – Nitrate was not detected in associated blanks.

3.3 REPRESENTATIVENESS

Representativeness was evaluated through a review of the following QA/QC elements:

- Sample preservation
- Sample holding times
- Compliance with sample collection, handling, and analysis methods specified in the Work Plan

Refer to QAPP Worksheets # 21 through # 27 for evaluation criteria related to representativeness.

3.3.1 February 2012

VOCs – Representativeness was acceptable.

SVOCs – Representativeness was acceptable. However, sample JP-M13-GWMWAEHA-14R was reanalyzed (original analysis reported low surrogate recovery) outside of the acceptable hold time. Detections were qualified with "J" and non-detects were qualified with UJ as a result.

Explosives – Representativeness was acceptable.

TAL Metals – Representativeness was acceptable.

Sulfate – Representativeness was acceptable.

Nitrate – Representativeness was acceptable.

3.3.2 April 2012

VOCs – Representativeness was acceptable.

SVOCs – Representativeness was acceptable.

Explosives – Representativeness was acceptable.

TAL Metals – Representativeness was acceptable.

Nitrate – Representativeness was acceptable. However samples JP-M13-GWMW999, JP-M13-GWMW809, JP-M13-GWMW806, and JP-M13-GWMW807 were reanalyzed outside of the acceptable hold time. Detections were qualified with "J" and non-detects were qualified with UJ.

Sulfate – Representativeness was acceptable.

3.4 COMPARABILITY

Comparability was qualitatively evaluated through a review of the following QA/QC elements:

- Sample collection and handling procedures
- Sample preparation, analysis, and quantitation procedures
- Units of measure

Refer to QAPP Worksheets # 21 through # 27 for evaluation criteria related to comparability.

Comparability was acceptable for the February and April 2012 sampling events.

3.5 COMPLETENESS

Completeness was calculated by dividing the number of acceptable sample results by the total number of scheduled sample results. The completeness goal for holding times was 100%. Completeness goals for holding times were met for all analytes in the April 2012 sampling round. The completeness goal for holding times for February 2012 samples was 97.7% since the SVOC results were re-run for sample JP-M13-GWAEHA14R outside of hold times.

The laboratory completeness goal for the number of acceptable sample results compared to the total sample results is 95%. Only results qualified "R" as unusable were considered unacceptable sample results for calculating laboratory completeness. Sample results qualified "J" as estimated, "U" as not detected, or "UJ" as not detected estimated quantitation limit were considered quantitative and acceptable.

No analytes were qualified "R" as unusable for the February and April 2012 sampling rounds with the exception of naphthalene due to the low biased surrogate recoveries for sample JP-M13-GWMWAEHA-14R (sampled March 1, 2012 associated with the February 2012 samples). However, this sample was reanalyzed and the re-run analyses resulted in no rejected results. Completeness was 100% for February 2012 and 100% for April 2012. Data usability was 100% for the February and April 2012 sampling rounds.

Refer to QAPP Worksheet #37 for the data usability criteria.

3.6 SENSITIVITY

Sensitivity was evaluated by comparing method reporting limits (MRLs) with appropriate criteria. In samples not requiring dilutions, adequate sensitivity was demonstrated with MRLs equal to or less than the associated criteria.

Refer to QAPP Worksheet #15 the Reference Limits and Evaluation Table for compound specific MRLs, method detection limits, and project action limits.

3.7 TRACEABILITY

Traceability was evaluated by reviewing field documentation, chain-of-custody documentation, and analytical reports. Each sample was found to be traceable from collection through analysis.

3.8 DATA QUALIFIERS

Refer to Tables 3.1 through 3.5 for summaries of groundwater and surface water data. Refer to Appendix B2 for data validation reports.

3.9 CONCLUSIONS

As discussed in section 3.5, completeness goals were met for the February and April 2012 analytical data. The data complies with contract requirements. The estimated data qualified "J" or "UJ" and blank qualified data qualified "U" which does not meet QA criteria are considered usable and do not negatively impact the project objectives. There were no biases or trends observed in this dataset.

4.0 REFERENCES

- DoD, 2006. Quality Systems Manual for Environmental Laboratories, Final Version 3, DoD Environmental Data Quality Workgroup. January 2006.
- MWH, 2011. Final Quality Assurance Project Plan (QAPP) JOAAP Environmental Remediation, MWH America's Inc. (MWH), March 2011.
- USEPA, 1986. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods Third Edition. November 1986.
- USEPA, 2008. USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review. June 2008.
- USEPA, 2010. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review. January 2010.

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B2 - DATA VALID	ATION REPORT	S – LABORAT (LDC)	ORY DATA C	ONSULTAN

LDC Validation Report #27391

(February 2012 Samples)



Laboratory Data Consultants, Inc.

7750 El Camino Real, Ste. 2L Carlsbad, CA 92009

Phone 760.634.0437

Web www.lab-data.com

Fax 760.634.0439

April 11, 2012

Toltest.

5201 Jewell Lane Poducah KY 42001

ATTN: Mr. Gary Reside

SUBJECT:

JOAAP-GW, Data Validation

Dear Mr. Reside,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on March 29, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27391:

SDG #	Fraction
500-44539-1 500-44555-1	Volatiles, Semivolatiles, Dissolved Metals, Wet Chemistry, Explosives

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan(QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. Rev. 0 July 2009
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1, April 2009
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink Project Manager

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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: February 29, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44539-1

Sample Identification

JP-M13-GWMW126R

JP-M13-GWMW362

JP-M13-GWMW806

JP-M13-GWMW807

JP-M13-GWMW809

JP-M13-GWMW999

JP-M13-GWMW808

TRIP BLANK

JP-M13-GWMW808MS

JP-M13-GWMW808MSD

Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
3/12/12	2-Butanone trans-1,3-Dichloropropene 2-Hexanone Hexachlorobutadiene 1,2,3-Trichlorobenzene	24.9 22.5 34.4 28.5 32.3	All samples in SDG 500-44539-1	J (all detects) UJ (all non-detects)	А

The percent difference (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
2/20/12	Dichlorodifluoromethane Chloromethane	27.6 21.7	All samples in SDG 500-44539-1	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	А

All of the continuing calibration relative response factors (RRF) for were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

Sample "TRIP BLANK" was identified as a trip blank. No volatile contaminants were found.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
JP-M13-GWMW808MS/MSD (JP-M13-GWMW808)	Vinyl acetate 2-Hexanone 1,1,2-Trichloroethane	`- ′	123 (45-121) 131 (55-130) 129 (75-125)	-	J (all detects) J (all detects) J (all detects)	А

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
500-142990/5	1,1,2-Trichloroethane	129 (75-125)	All samples in SD 500-44539-1	J (all detects)	Р

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples JP-M13-GWMW809 and JP-M13-GWMW999 were identified as field duplicates. No volatiles were detected in any of the samples.

JOAAP-GW Volatiles - Data Qualification Summary - SDG 500-44539-1

SDG	Sample	Compound	Flag	A or P	Reason
500-44539-1	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW999 JP-M13-GWMW999 JP-M13-GWMW808	2-Butanone trans-1,3-Dichloropropene 2-Hexanone Hexachlorobutadiene 1,2,3-Trichlorobenzene	J (all detects) UJ (all non-detects)	Α	Continuing calibration (%D)
500-44539-1	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW999 JP-M13-GWMW999 JP-M13-GWMW808	Dichlorodifluoromethane Chloromethane	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
500-44539-1	JP-M13-GWMW808	Vinyl acetate 2-Hexanone 1,1,2-Trichloroethane	J (all detects) J (all detects) J (all detects)	А	Matrix spike/Matrix spike duplicate (%R)
500-44539-1	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW809 JP-M13-GWMW999 JP-M13-GWMW808 TRIP BLANK	1,1,2-Trichloroethane	J (all detects)	Р	Laboratory control samples (%R)

JOAAP-GW

Volatiles - Laboratory Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

JOAAP-GW

Volatiles - Field Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

Job Number: 500-44539-1 Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMW126R

Lab Sample ID:

500-44539-1

Client Matrix:

Water

Date Sampled: 02/29/2012 1000

Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:

8260B 5030B Analysis Batch:

500-142990

Instrument ID:

CMS18

Prep Method: Dilution:

Prep Batch:

N/A

Lab File ID: Initial Weight/Volume: 44539-01.D 5 mL

1.0

Final Weight/Volume:

5 mL

Analysis Date: Prep Date:

03/13/2012 0055 03/13/2012 0055

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0 (ブ		1.0	5.0
n-Bulylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0 US		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chiorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0 UJ		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0 VJ		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0 ∪∑		0.56	5.0
Hexachiorobutadiene	<1.0 UT		0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0,63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0
* * *				

Job Number: 500-44539-1 Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMW126R

Lab Sample ID: Client Matrix:

500-44539-1

Water

Date Sampled: 02/29/2012 1000

Date Received: 03/01/2012 0947

8260B VOC

N/A

Analysis Method: Prep Method:

8260B 5030B

1.0

Analysis Batch: Prep Batch:

500-142990

Instrument ID:

CMS18

Lab File ID:

44539-01.D

Initial Weight/Volume:

5 mL

Final Weight/Volume:

5 mL

Analysis Date: Prep

Dilution:

03/13/2012 0055

Prec	Date:	

03/13/2012 0055

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachioroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0 US		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0	*	0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits	
4-Bromofluorobenzene (Surr)	102		75 - 120	
Dibromofluoromethane	109		85 - 115	
1,2-Dichloroethane-d4 (Surr)	91		70 - 120	
Toluene-d8 (Surr)	98		85 - 120	

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Job Number: 500-44539-1 Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMW362

Lab Sample ID:

500-44539-2

Client Matrix:

Water

Date Sampled: 02/29/2012 1120

Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:

8260B 5030B Analysis Batch:

500-142990

Instrument ID:

CMS18 44539-02.D

Prep Method: Dilution:

1.0

Prep Batch:

N/A

Lab File ID: Initial Weight/Volume:

5 mL

Analysis Date:

03/13/2012 0119

Final Weight/Volume:

5 mL

Prep Date:

03/13/2012 0119

	Result (ug/L)	Qualifier	MDL	RL	
Acetone	<5.0		1.9	5.0	
Benzene	<1.0		0.12	1.0	
Bromobenzene	<1.0		0.31	1.0	
Bromochloromethane	<1.0		0.50	1.0	
Bromodichloromethane	<1.0		0.23	1.0	
Bromoform	<1.0		0.45	1.0	
Bromomethane	<1.4		0.49	1.4	
2-Butanone (MEK)	خ5.0 ن ک		1.0	5.0	
n-Butylbenzene	<1.0		0.21	1.0	
sec-Butylbenzene	<1.0		0.19	1.0	
tert-Butylbenzene	<1.0		0.24	1.0	
Carbon disulfide	<5.0		0.44	5.0	
Carbon tetrachloride	<1.0		0.28	1.0	
Chlorobenzene	<1.0		0.24	1.0	
Dibromochloromethane	<1.0		0.25	1.0	
Chloroethane	<1.4		0.33	1.4	
Chloroform	<1.0		0.25	1.0	
Chloromethane	<1.0 VS		0.24	1.0	
2-Chlorotoluene	<1.0		0.21	1.0	
Vinyl acetate	<2.0		0.48	2.0	
4-Chlorotoluene	<1.0		0.21	1.0	
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6	
1,2-Dibromoethane	<1.0		0.45	1.0	
Dibromomethane	<1.0		0.39	1.0	
1,2-Dichlorobenzene	<1.0		0.21	1.0	
1,3-Dichlorobenzene	<1.0		0.26	1.0	
1,4-Dichlorobenzene	<1.0		0.24	1.0	
Dichlorodifluoromethane	<1.0 ƯS		0.26	1.0	
1,1-Dichloroethane	<1.0		0.24	1.0	
1,2-Dichloroethane	<1.0		0.28	1.0	
1,1-Dichloroethene	<1.0		0.29	1.0	
cis-1,2-Dichloroethene	<1.0		0.22	1.0	
trans-1,2-Dichloroethene	<1.0		0.27	1.0	
1,2-Dichloropropane	<1.0		0.36	1.0	
1,3-Dichloropropane	<1.0		0.27	1.0	
2,2-Dichloropropane	<1.0		0.31	1.0	
1,1-Dichloropropene	<1.0		0.25	1.0	
cis-1,3-Dichloropropene	<1.0		0.28	1.0	
trans-1,3-Dichloropropene	<1.0 VS		0.35	1.0	
Ethylbenzene	<1.0		0.14	1.0	
2-Hexanone	<5.0 ひろ		0.56	5.0	
Hexachlorobutadiene	کل 1.0>		0.45	1.0	
Isopropylbenzene	<1.0		0.21	1.0	
p-Isopropyltoluene	<1.0		0.24	1.0	
Methylene Chloride	<3.0		0.63	3.0	
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0	
TestAmerica Chicago	Page 23 of 1	037	uloliz	/ 03/22	/20

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW362

Lab Sample ID:

500-44539-2

Client Matrix:

Water

Date Sampled: 02/29/2012 1120

Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:

8260B 5030B Analysis Batch:

500-142990

Instrument ID:

CMS18

Prep Method: Dilution:

Prep Batch:

N/A

Lab File ID: Initial Weight/Volume: 44539-02.D 5 mL

Analysis Date: Prep Date:

1.0

03/13/2012 0119

03/13/2012 0119

Final Weight/Volume:

5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0	······································	0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachioroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0 VS		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0	*	0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0
Surrogate	%Rec	Qualifier Acceptance Limits		
4-Bromofluorobenzene (Surr)	98	75 - 120)
• •	400		05 115	•

103

90

103

024/10/12

85 - 115

70 - 120

85 - 120

Dibromofluoromethane

Toluene-d8 (Surr)

1,2-Dichloroethane-d4 (Surr)

Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW806

Lab Sample ID:

500-44539-3

Client Matrix:

Water

Date Sampled: 02/29/2012 1300

Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:

8260B 5030B Analysis Batch:

500-142990

Instrument ID:

CMS18

Prep Method:

Prep Batch:

N/A

Lab File ID: Initial Weight/Volume:

44539-03.D 5 mL

Dilution: Analysis Date: 1.0

03/13/2012 0144

Final Weight/Volume:

5 mL

Prep Date:

03/13/2012 0144

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochioromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0 び		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0 VS		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0 VS		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1,0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0,25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0 い		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0 <i>い</i> ろ		0.56	5.0
	حا.0 کا جاری داد		0.45	1.0
Hexachlorobutadiene Isopropylbenzene	<1.0		0.21	1.0
p-isopropyltoluene	<1.0		0.24	1.0
	<3.0		0.63	3.0
Methylene Chloride	<5.0		0.79	5.0
4-Methyl-2-pentanone (MIBK)	-0.0		=::•	

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0.79 5.0 03/22/2012

Client Sample ID:

JP-M13-GWMW806

Lab Sample ID:

500-44539-3

Client Matrix:

Water

Date Sampled: 02/29/2012 1300

Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:

8260B 5030B Analysis Batch:

500-142990

Instrument ID:

CMS18

Prep Method: Dilution:

1.0

Prep Batch:

Lab File ID:

44539-03.D

Prep Date:

N/A

Initial Weight/Volume:

5 mL

Analysis Date:

03/13/2012 0144 03/13/2012 0144 Final Weight/Volume:

5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0 ن اح		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0	*	0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0
Surrogate	%Rec	Qualifier	Accepta	nce Limits

99

103

90

100

75 - 120

85 - 115

70 - 120

85 - 120

4-Bromofluorobenzene (Surr)

1,2-Dichloroethane-d4 (Surr)

Dibromofluoromethane

Toluene-d8 (Surr)

Client Sample ID:

JP-M13-GWMW807

Lab Sample ID: Client Matrix:

500-44539-4

Water

Date Sampled: 02/29/2012 1350

Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:

8260B

Analysis Batch:

500-142990

Instrument ID:

CMS18 44539-04.D

Prep Method: Dilution:

5030B

Prep Batch:

N/A

Lab File ID: Initial Weight/Volume:

5 mL

Analysis Date:

1.0

03/13/2012 0209

Final Weight/Volume:

5 mL

Prep Date:

03/13/2012 0209

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0 U∕S		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
ec-Butylbenzene	<1.0		0.19	1.0
ert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	2.4	J	0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	حر _{1.0} حر		0.24	1.0
-Chlorotoluene	<1.0		0.21	1.0
/inyl acetate	<2.0		0.48	2.0
-Chlorotoluene	<1.0		0.21	1.0
,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
.2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
.2-Dichlorobenzene	<1.0		0.21	1.0
,3-Dichloroberizene	<1.0		0.26	1.0
,4-Dichlorobenzene	<1.0		0.24	1.0
ichlorodifluoromethane	<1.0 VS		0.26	1.0
,1-Dichloroethane	1.4		0.24	1.0
•	<1.0		0.28	1.0
,2-Dichloroethane	<1.0		0.29	1.0
,1-Dichloroethene	0.79	J	0.22	1.0
tis-1,2-Dichloroethene	<1.0	v	0.27	1.0
rans-1,2-Dichloroethene	<1.0		0.36	1.0
,2-Dichloropropane	<1.0		0.27	1.0
,3-Dichloropropane	<1.0		0.31	1.0
,2-Dichloropropane	<1.0		0.25	1.0
,1-Dichloropropene	<1.0		0.28	1.0
is-1,3-Dichloropropene	دا.٥ دا.٥ ک		0.35	1.0
rans-1,3-Dichloropropene	<1.0		0.14	1.0
Ethylbenzene	<5.0 √5		0.56	5.0
2-Hexanone	<1.0 V		0.45	1.0
lexachlorobutadiene			0.43	1.0
sopropylbenzene	<1.0		0.24	1.0
-Isopropyltoluene	<1.0		0.63	3.0
Methylene Chloride	<3.0		0.63	5.0
-Methyl-2-pentanone (MIBK)	<5.0			
FestAmerica Chicago	Page 27 of 1	1037	ruloll	03/22/201

Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW807

Lab Sample ID:

500-44539-4

Client Matrix:

Water

Date Sampled: 02/29/2012 1350

Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:

8260B 5030B Analysis Batch:

500-142990

Instrument ID:

CMS18

Prep Method:

Prep Batch:

N/A

Lab File ID:

44539-04.D

Dilution:

1.0

03/13/2012 0209

Initial Weight/Volume:

5 mL

Analysis Date: Prep Date:

03/13/2012 0209

Final Weight/Volume:

5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0 が		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
I,1,2-Trichloroethane	<1.0	*	0.30	1.0
Frichloroethene	<1.0		0.18	1.0
Frichlorofluoromethane	<1.0		0.22	1.0
,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1,0		0.23	1.0
/inyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
n&p-Xylene	<2.0		0.30	2.0
Kylenes, Total	<1.0		0.30	1.0
Surrogate	%Rec	Qualifier		ınce Limits
4-Bromofluorobenzene (Surr)	97		75 - 120	

104

91

97

85 - 115

70 - 120

85 - 120

Dibromofluoromethane

Toluene-d8 (Surr)

1,2-Dichloroethane-d4 (Surr)

Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW809

Lab Sample ID:

500-44539-5

Client Matrix:

Water

Date Sampled: 02/29/2012 1700

Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:

8260B

Analysis Batch:

500-142990

Instrument ID:

CMS18

Prep Method:

5030B

Lab File ID:

44539-05.D

Dilution:

1.0

Prep Batch:

N/A

Initial Weight/Volume:

5 mL

Analysis Date:

03/13/2012 0234

Prep Date:

03/13/2012 0234

Final Weight/Volume:

5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene -	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0 ひ		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
eri-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
	<1.4		0.33	1.4
Chloroethane	<1.0		0.25	1.0
Chloroform	ح _{1.0} مح		0.24	1.0
Chloromethane	<1.0		0.21	1.0
2-Chlorotoluene	<2.0		0.48	2.0
Vinyl acetate	<1.0		0.21	1.0
4-Chlorotoluene	<2.6		1.2	2.6
1,2-Dibromo-3-Chloropropane	<1.0		0.45	1.0
I,2-Dibromoethane	<1.0		0.39	1.0
Dibromomethane			0.21	1.0
I,2-Dichlorobenzene	<1.0		0.26	1.0
1,3-Dichlorobenzene	<1.0		0.24	1.0
i,4-Dichlorobenzene	<1.0 <1.0 び		0.26	1.0
Dichlorodifluoromethane			0.24	1.0
i,1-Dichloroethane	<1.0		0.28	1.0
1,2-Dichloroethane	<1.0		0.29	1.0
1,1-Dichloroethene	<1.0			1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
rans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	خار c1.0 کا		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0 U∑		0.56	5.0
Hexachlorobutadiene	<1.0 び		0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0
TestAmerica Chicago	Page 29 of 10:	37	muli	5.0

Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW809

Lab Sample ID:

500-44539-5

Client Matrix:

Water

Date Sampled: 02/29/2012 1700

Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:

8260B 5030B Analysis Batch:

500-142990

Instrument ID:

CMS18

Prep Method: Analysis Date:

1.0

Prep Batch:

N/A

Lab File ID:

44539-05.D

Dilution:

03/13/2012 0234

Initial Weight/Volume: Final Weight/Volume:

5 mL 5 mL

Prep Date:

03/13/2012 0234

Analyte	Result (ug/L)	Qualifier	MDL	RL	
Methyl tert-butyl ether	<1.0		0.28	1.0	
Naphthalene	<1.0		0.24	1.0	
N-Propylbenzene	<1.0		0.19	1.0	
Styrene	<1.0		0.26	1.0	
1.1.1.2-Tetrachloroethane	<1.0		0.31	1.0	
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0	
Tetrachloroethene	<1.0		0.22	1.0	
Toluene	<1.0		0.15	1,0	
1,2,3-Trichlorobenzene	<1.0 کا		0.36	1.0	
1,2,4-Trichlorobenzene	<1.0		0.22	1.0	
1.1.1-Trichloroethane	<1.0		0.26	1.0	
1,1,2-Trichloroethane	<1.0	*	0.30	1.0	
Trichloroethene	<1.0		0.18	1.0	
Trichlorofluoromethane	<1.0		0.22	1.0	
1,2,3-Trichloropropane	<1.2		0.60	1.2	
1,2,4-Trimethylbenzene	<1.0		0.22	1.0	
1,3,5-Trimethylbenzene	<1.0		0.23	1.0	
Vinyl chloride	<1.0		0.13	1.0	
o-Xylene	<1.0		0.13	1.0	
m&p-Xylene	<2.0		0.30	2.0	
Xylenes, Total	<1.0		0.30	1.0	

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	97		75 - 120
Dibromofluoromethane	107		85 - 115
1,2-Dichloroethane-d4 (Surr)	94		70 - 120
Toluene-d8 (Surr)	105		85 - 120

Client Sample ID:

JP-M13-GWMW999

Lab Sample ID: Client Matrix:

500-44539-6

Water

Date Sampled: 02/29/2012 1200

Date Received: 03/01/2012 0947

8260B VOC

Analysis Method: Prep Method:

8260B 5030B Analysis Batch:

500-142990

instrument ID:

CMS18 44539-06.D

Dilution:

Prep Batch:

N/A

Lab File ID: Initial Weight/Volume:

5 mL

Analysis Date:

1.0

03/13/2012 0259

Final Weight/Volume:

5 mL

Prep Date:

03/13/2012 0259

Analyle	Result (ug/L)	Qualifier	MDL	RL	ogganggangs proposensked kanadativa ke
Acetone	<5.0		1.9	5.0	
Benzene	<1.0		0.12	1.0	
Bromobenzene	<1.0		0.31	1.0	
Bromochloromethane	<1.0		0.50	1.0	
Bromodichloromethane	<1.0		0.23	1.0	
Bromoform	<1.0		0.45	1.0	
Bromomethane	<1.4		0.49	1.4	
2-Butanone (MEK)	کن _{<5.0} ح		1.0	5.0	
n-Butylbenzene	<1.0		0.21	1.0	
sec-Butylbenzene	<1.0		0.19	1.0	
tert-Butylbenzene	<1.0		0.24	1.0	
Carbon disulfide	<5.0		0.44	5.0	
Carbon tetrachloride	<1.0		0.28	1.0	
Chlorobenzene	<1.0		0.24	1.0	
Dibromochloromethane	<1.0		0.25	1.0	
Chloroethane	<1.4		0.33	1.4	
Chioroform	<1.0		0.25	1.0	
Chloromethane	<1.0 كك		0.24	1.0	
2-Chlorotoluene	<1.0		0.21	1.0	
Vinyl acetate	<2.0		0.48	2.0	
4-Chlorotoluene	<1.0		0.21	1.0	
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6	
	<1.0		0.45	1.0	
1,2-Dibromoethane	<1.0		0.39	1.0	
Dibromomethane	<1.0		0.21	1.0	
1,2-Dichlorobenzene	<1.0		0.26	1.0	
1,3-Dichlorobenzene	<1.0		0.24	1.0	
1,4-Dichlorobenzene	کر 1.0 د		0.26	1.0	
Dichlorodifluoromethane	<1.0		0.24	1.0	
1,1-Dichloroethane	<1.0		0.28	1.0	
1,2-Dichloroethane	<1.0		0.29	1.0	
1,1-Dichloroethene	<1.0		0.22	1.0	
cis-1,2-Dichloroethene	<1.0		0.27	1.0	
trans-1,2-Dichloroethene	<1.0		0.36	1.0	
1,2-Dichloropropane	<1.0		0.27	1.0	
1,3-Dichloropropane	<1.0		0.31	1.0	
2,2-Dichloropropane	<1.0		0.25	1.0	
1,1-Dichloropropene	<1.0		0.28	1.0	
cis-1,3-Dichloropropene	ر خان 1.0×		0.35	1.0	
trans-1,3-Dichloropropene			0.14	1.0	
Ethylbenzene	<1.0 <5.0 ぴう		0.56	5.0	
2-Hexanone	<1.0 US		0.45	1.0	
Hexachlorobutadiene			0.45	1.0	
Isopropylbenzene	<1.0		0.24	1.0	
p-Isopropyltoluene	<1.0		0.63	3.0	
Methylene Chloride	<3.0		0.03	5.0	
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0	

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Analytical Data

Job Number: 500-44539-1 Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMW999

Lab Sample ID: Client Matrix:

500-44539-6

Water

Date Sampled: 02/29/2012 1200

Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:

8260B 5030B Analysis Batch:

500-142990

Instrument ID:

CMS18

Prep Method: Dilution:

1.0

Prep Batch:

N/A

Lab File ID: Initial Weight/Volume: 44539-06.D 5 mL

Analysis Date:

03/13/2012 0259

03/13/2012 0259

Final Weight/Volume:

5 mL

Prep Date:

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1.1.1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachioroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	خار _{1.0} حا		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0	*	0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	95		75 - 120
Dibromofluoromethane	105		85 - 115
1.2-Dichloroethane-d4 (Surr)	92		70 - 120
Toluene-d8 (Surr)	104		85 - 120

Client Sample ID:

JP-M13-GWMW808

Lab Sample ID:

500-44539-7

Client Matrix:

Water

Date Sampled: 02/29/2012 1510

Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:

8260B

Analysis Batch:

500-142990

Instrument ID:

CMS18

Prep Method: Dilution:

5030B

Prep Batch:

N/A

Lab File ID: Initial Weight/Volume: 44539-07.D 5 mL

Analysis Date:

Prep Date:

1.0

03/13/2012 0324

03/13/2012 0324

Final Weight/Volume:

5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0 ぴ		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0 <i>い</i> ろ		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
	<2.0		0.48	2.0
Vinyl acetate	<1.0		0.21	1.0
4-Chlorotoluene	<2.6		1.2	2.6
1,2-Dibromo-3-Chloropropane	<1.0		0.45	1.0
1,2-Dibromoethane	<1.0		0.39	1.0
Dibromomethane	<1.0		0.21	1.0
1,2-Dichlorobenzene	<1.0		0.26	1.0
1,3-Dichlorobenzene	<1.0		0.24	1.0
1,4-Dichlorobenzene	<1.0 √5		0.26	1.0
Dichlorodifluoromethane	<1.0		0.24	1.0
1,1-Dichloroethane	<1.0		0.28	1.0
1,2-Dichloroethane			0.29	1.0
1,1-Dichloroethene	<1.0		0.22	1.0
cis-1,2-Dichloroethene	<1.0		0.27	1.0
trans-1,2-Dichloroethene	<1.0		0.36	1.0
1,2-Dichloropropane	<1.0		0.30	1.0
1,3-Dichloropropane	<1.0		0.31	1.0
2,2-Dichloropropane	<1.0			1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	خار.0 د د		0.35	
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0 v5		0.56	5.0
Hexachlorobutadiene	ح _{1.0} کک		0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

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03/22/2012

Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW808

Lab Sample ID:

500-44539-7

Client Matrix:

Water

Date Sampled: 02/29/2012 1510

Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:

8260B

Analysis Batch:

500-142990

Instrument ID:

CMS18

Prep Method:

5030B

Prep Batch:

N/A

Lab File ID:

44539-07.D 5 mL

Dilution:

1.0

03/13/2012 0324

Initial Weight/Volume:

Analysis Date: Prep Date:

03/13/2012 0324

Final Weight/Volume:

5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL	
Methyl tert-butyl ether	<1.0		0.28	1.0	
Naphthalene	<1.0		0.24	1.0	
N-Propylbenzene	<1.0		0.19	1.0	
Styrene	<1.0		0.26	1.0	
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0	
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0	
Tetrachloroethene	<1.0		0.22	1.0	
Toluene	<1.0		0.15	1.0	
1,2,3-Trichlorobenzene	کک 1.0<		0.36	1.0	
1,2,4-Trichlorobenzene	<1.0		0.22	1.0	
1,1,1-Trichloroethane	<1.0		0.26	1.0	
1,1,2-Trichloroethane	<1.0	*	0.30	1.0	
Trichloroethene	<1.0		0.18	1.0	
Trichlorofluoromethane	<1.0		0.22	1.0	
1,2,3-Trichloropropane	<1.2		0.60	1.2	
1,2,4-Trimethylbenzene	<1.0		0.22	1.0	
1,3,5-Trimethylbenzene	<1.0		0.23	1.0	
Vinyl chloride	<1.0		0.13	1.0	
o-Xylene	<1.0		0.13	1.0	
m&p-Xylene	<2.0		0.30	2.0	
Xylenes, Total	<1.0		0.30	1.0	

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	96		75 - 120
Dibromofluoromethane	105		85 - 115
1,2-Dichloroethane-d4 (Surr)	93		70 - 120
Toluene-d8 (Surr)	95		85 - 120

Client Sample ID:

TRIP BLANK

Lab Sample ID:

500-44539-8TB

Client Matrix:

Water

Date Sampled: 02/29/2012 0000 Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:

8260B

Analysis Batch:

500-142990

Instrument ID:

CMS18

Prep Method: Dilution:

5030B

Prep Batch:

N/A

Lab File ID: Initial Weight/Volume: 44539-08.D 5 mL

Analysis Date:

1.0

03/13/2012 0439

Final Weight/Volume:

5 mL

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F	٦r	е	p	D	at	e:		

03/13/2012 0439

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0 ♂≤		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0 √5		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0 🗸		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0 VS		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0 US		0.56	5.0
Hexachlorobutadiene	كن _{1.0>}		0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0
1 menting bannenana fame, A				1

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5.0 CUIDIT 03/22/2012

Job Number: 500-44539-1

Client Sample ID:

TRIP BLANK

Lab Sample ID:

500-44539-8TB

Client Matrix:

Water

Date Sampled: 02/29/2012 0000

Date Received: 03/01/2012 0947

8260B VOC

Analysis Method:

8260B 5030B Analysis Batch:

500-142990

Instrument ID:

CMS18 44539-08.D

Prep Method: Dilution:

1.0

Prep Batch:

N/A

Lab File ID: Initial Weight/Volume:

5 mL

Analysis Date:

03/13/2012 0439

Final Weight/Volume:

5 mL

Prep Date:

03/13/2012 0439

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	حا.0 کا خان جاری جاری		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
• •	<1.0	•	0.30	1.0
1,1,2-Trichloroethane	<1.0		0.18	1.0
Trichloroethene	<1.0		0.22	1.0
Trichlorofluoromethane	<1.2		0.60	1.2
1,2,3-Trichloropropane	<1.0		0.22	1.0
1,2,4-Trimethylbenzene	<1.0		0.23	1.0
1,3,5-Trimethylbenzene	<1.0		0.13	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene			0.30	2.0
m&p-Xylene	<2.0		0.30	1.0
Xylenes, Total	<1.0		0.50	1.0
Surrogate	%Rec	Qualifier	Accepta	ance Limits

Surrogate	%Rec	Qualifier	Acceptance Limits	
4-Bromofluorobenzene (Surr)	97		75 - 120	
Dibromofluoromethane	110		85 - 115	
1,2-Dichloroethane-d4 (Surr)	91		70 - 120	
Toluene-d8 (Surr)	105		85 - 120	

LDC #:	27391A1	VALIDATION COMPLETENESS WORKSHEET
SDG #:_	500-44539-1	Level III
Laborato	ry: Test America, Inc.	

Date: 4 4 12
Page: <u>/</u> of
Reviewer: 6K
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Technical holding times	A	Sampling dates: 02 29 12
II.	GC/MS Instrument performance check	/ }	,
III.	Initial calibration	ħ	KSD = 30 15 ? 12
IV.	Continuing calibration/ICV	SW	$KSV \leq 30 15? r^2$ $ cv / ccv \leq 20 1.$
V.	Blanks	A-	,
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	ધાર	
VIII.	Laboratory control samples	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	Ą	
XVI.	Field duplicates	NO	F0 = 5 + 6
XVII.	Field blanks	ND	TB = 8

Note:

A = Acceptable N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate FB = Field blank

D = Duplicate TB = Trip blank
EB = Equipment blank

Validated Samples: Water

1	JP-M13-GWMW126R	11	500 - 142990-MB	21	31	
2	JP-M13-GWMW362	12		22	32	
3	JP-M13-GWMW806	13		23	33	
4	JP-M13-GWMW807	14		24	34_	
5	JP-M13-GWMW809	15		25	 35	
6	JP-M13-GWMW999	16		26	 36	
7	JP-M13-GWMW808	17		27	37	
8	TRIP BLANK	18		28	38	
9	JP-M13-GWMW808MS	19		29	 39	
10	JP-M13-GWMW808MSD	20		30	40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B Bromomethane	V, Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyt alcohol
C Vind choride**	W. trans-1.3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
C. Chloroethane	X, Bromoform*	RR. Dibromomethane	L.L. Hexachlorobutadiene	FFFF. Acrolein
F. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG, Acrylonitrile
E Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU, 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	III. Isobutył akohol
H. 1.1-Dichloroethene**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP, trans-1,2-Dichloroethene	JJJJ. Methacrytonitrile
I. 1.1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1.2-Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform**	EE. Ethylbenzene**	YY, n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1.2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorofoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNN.
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichiorotetrafluoroethane	.0000
N. 1.1.1-Trichloroethane	HH. Vinyî acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	рррр.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	מססס.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropy! ether	RRRR.
O. 1.2-Dichloropropane**	KK. Trichlorofluoromethane	EEE, sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	222. tert-Butyl alcohol	TITT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-fsopropyltoluene	AAAA. Ethyl tert-butyl ether	ບບບບ.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	ww.

^{* =} System performance check compounds (SPCC) for RRF; ** = Calibration check compounds (CCC) for %RSD.

LDC#: 27311A1

VALIDATION FINDINGS WORKSHEET

Continuing Calibration

Reviewer: 2nd Reviewer:_

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Phase see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Was a continuing calibration standard analyzed at least once every 12 hours for each instrument? Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ? Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

Qualifications 4/2M/2 31WJ A Associated Samples Finding RRF (Limit: >0.05) Finding %D 20 (Limit: <25,0%) 21.7 28.5 32.3 22.5 24.9 27. (34.4 Compound 222 ひて 3 3/4/ CA 518 Standard ID 18C0312n 2 3 Date 3 [2] X N N/A

LDC #: 2731A SDG #: Bec Cover

Matrix Spike/Matrix Spike Duplicates VALIDATION FINDINGS WORKSHEET

Page: Reviewer: 2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Note an artix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an Y N/A

associated MS/MSD. Soil / Water.

Was a MS/MSD analyzed every 20 samples of each matrix?

Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits? N/A

*	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		9/12	土土	123(45-121)	(123(45-14)	()	+	11.4 14
			2	()	(861-35) [8]	()		
			5	(321-34) 181	129 (75-125)	(>
				()	()	()		
				()	()	()		
				())	(
				•	()	(
				()	()	(
				()	()	()		
				()	()	()		
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				()	()	()		
				()	()	()		
				()	()	•		
				`		():		
				~	·	·)		
				·)·	(()	-	
				()	()	(
		Compound	punc	ac Lim	Limits (Soil)	RPD (Soll)	QC Limits (Water)	RPD (Water)
	ヹ	1,1-Dichloroethene		59-1	59-172%	≥ 22%	61-145%	≥ 14%
	တ်	Trichloroethene		62-1	62-137%	≥ 24%	71-120%	≤ 14%
	>	Benzene		66-1	66-142%	≥ 21%	76-127%	<u><</u> 11%
	8	Toluene		59-1	59-139%	≥ 21%	76-125%	≤ 13%
	.00	Chlorobenzene		1-09	60-133%	≥ 21%	75-130%	≥ 13%

LDC #: 27391A1 SDG #: Ste envey

VALIDATION FINDINGS WORKSHEET Laboratory Control Samples (LCS)

Jo J Page: Reviewer: 2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Was a LCS required? Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

			Γ		_		<u> </u>																	
Qualifications	J Let / 1/ P																							
Associated Samples	All																							
RPD (Limits)	()	^ `	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	())	()		(
LCSD %R (Limits)	()	~	()	()	()	()	()	()	(()	()	()	()	()	(()	())	())	()			()
LCS %R (Limits)	129 (75-125)	()	^	()	()	()	(()	()	()	•		~	()	`)	•		())
Compound	3																							
rcs/rcsd id	5/06/27-1-005																							
Date																								
*															L			<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u></u>	<u> </u>	<u> </u>

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: February 29, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Semivolatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44539-1

Sample Identification

JP-M13-GWMW126R

JP-M13-GWMW362

JP-M13-GWMW806

JP-M13-GWMW807

JP-M13-GWMW809

JP-M13-GWMW999

JP-M13-GWMW808

JP-M13-GWMW808MS

JP-M13-GWMW808MSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs) with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
3/15/12	3&4-Methylphenol Benzoic acid Fluorene Butylbenzylphthalate Bis(2-ethylhexyl)phthalate Benzo(k)fluoranthene	17.0 25.0 16.0 18.0 20.0 19.0	All samples in SDG 500-44539-1	J (all detects) UJ (all non-detects)	А

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	<u>%</u> D	Associated Samples	Flag	A or P
3/15/12	4-Chlorophenyl-phenyl ether 2,4-Dimethylphenol 2-Methylnaphthalene 2,4,6-Trichlorophenol 2-Chloronaphthalene Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol 4-Nitrophenol Fluorene N-Nitrosodiphenylamine 4-Bromophenyl-phenyl ether Hexachlorobenzene Phenanthrene Anthracene Carbazole Benzo(a)anthracene	20.2 21.5 23.4 22.2 20.6 20.5 25.8 20.5 22.1 23.8 21.3 24.0 21.9 21.7 20.5 21.8	All samples in SDG 500-44539-1	J (all detects) UJ (all non-detects)	А

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
JP-M13-GWMW808MS/MSD (JP-M13-GWMW808)	Benzo(a)pyrene Di-n-octylphthalate	116 (55-110) -	120 (55-110) 141 (35-135)	1 1	J (all detects) J (all detects)	А

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples JP-M13-GWMW809 and JP-M13-GWMW999 were identified as field duplicates. No semivolatiles were detected in any of the samples.

JOAAP-GW Semivolatiles - Data Qualification Summary - SDG 500-44539-1

SDG	Sample	Compound	Flag	A or P	Reason
500-44539-1	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW809 JP-M13-GWMW999 JP-M13-GWMW808	3&4-Methylphenol Benzoic acid Fluorene Butylbenzylphthalate Bis(2-ethylhexyl)phthalate Benzo(k)fluoranthene	J (all detects) UJ (all non-detects)	A	Initial calibration (%RSD)
500-44539-1	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW806 JP-M13-GWMW807 JP-M13-GWMW809 JP-M13-GWMW999 JP-M13-GWMW808	4-Chlorophenyl-phenyl ether 2,4-Dimethylphenol 2-Methylnaphthalene 2,4,6-Trichlorophenol 2-Chloronaphthalene Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol 4-Nitrophenol Fluorene N-Nitrosodiphenylamine 4-Bromophenyl-phenyl ether Hexachlorobenzene Phenanthrene Anthracene Carbazole Benzo(a)anthracene	J (all detects) UJ (all non-detects)	А	Continuing calibration (ICV %D)
500-44539-1	JP-M13-GWMW808	Benzo(a)pyrene Di-n-octylphthalate	J (all detects) J (all detects)	Α	Matrix spike/Matrix spike duplicate (%R)

JOAAP-GW

Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

JOAAP-GW

Semivolatiles - Field Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW126R

Lab Sample ID:

500-44539-1

Client Matrix:

Water

Date Sampled: 02/29/2012 1000

Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:

8270C

Analysis Batch:

500-143421

Instrument ID:

CMS23

Prep Method: Dilution:

3510C

Prep Batch:

500-142158

Lab File ID:

44539-1.d 1050 mL

1.0

Initial Weight/Volume: Final Weight/Volume:

1.0 mL

Analysis Date:

03/16/2012 1722

Injection Volume:

1 uL

03/02/2012 0915

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.95 いろ		0.34	0.95
N-Nitrosodimethylamine	<9.5		1.3	9.5
Acenaphthylene	<0.95		0.30	0.95
Anthracene	<0.95 UT		0.30	0.95
Benzidine	<38		19	38
Benzoic acid	<19 UJ		4.3	19
Benzo[a]anthracene	<0.19 び		0.042	0.19
Benzo[b]fluoranthene	<0.19		0.055	0.19
Benzo[k]fluoranthene	<0.24 05		0.070	0.24
Benzo[g,h,i]perylene	<0.95		0.40	0.95
Benzo[a]pyrene	<0.19		0.053	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.29	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.29	1.9
Bis(2-ethylhexyl) phthalate	<9.5 Uブ		2.3	9.5
4-Bromophenyl phenyl ether	<4.8 VS		0.87	4.8
Butyl benzyl phthalate	<1.9 VJ		0.26	1.9
Carbazole	<4.8 US		0.94	4.8
4-Chloroaniline	<9.5		2.0	. 9.5
4-Chloro-3-methylphenol	<9.5		2.1	9.5
2-Chloronaphthalene	<1.9 VS		0.32	1.9
2-Chlorophenol	<4.8		0.76	4.8
4-Chlorophenyl phenyl ether	<4.8 టెన్		0.77	4.8
Chrysene	<0.48		0.13	0.48
Dibenz(a,h)anthracene	<0.29		0.061	0.29
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.8		0.76	4.8
1,2-Dichlorobenzene	<1.9		0.28	1.9
1,3-Dichlorobenzene	<1.9		0.24	1.9
1,4-Dichlorobenzene	<1.9		0.26	1.9
3,3'-Dichlorobenzidine	<4.8		0.90	4.8
2,4-Dichlorophenol	<9.5		2.2	9.5
•	<1.9		0.42	1,9
Diethyl phthalate	<9.5 US		3.2	9.5
2,4-Dimethylphenol	<1.9		0.36	1.9
Dimethyl phthalate	<19		4.7	19
4,6-Dinitro-2-methylphenol	<19 05	٨	7.1	19
2,4-Dinitrophenol	<1.3		0.29	1.3
2,4-Dinitrotoluene	<0.48		0.11	0,48
2,6-Dinitrotoluene	<9.5		2.4	9.5
Di-n-octyl phthalate	<0.95		0.30	0.95
Fluoranthene	<0.95 VJ		0.36	0.95
Fluorene	<4.8		0.67	4.8
1,2-Diphenylhydrazine	<0.48 US		0.13	0.48
Hexachlorobenzene	<4.8		1 1	4.8
Hexachlorobutadiene	~4.0		1.1	
TestAmerica Chicago	Page 37 of 103	7	Ny	10/12 03/22/203

Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW126R

Lab Sample ID:

500-44539-1

Client Matrix:

Water

Date Sampled: 02/29/2012 1000

Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:

8270C 3510C

Analysis Batch: Prep Batch:

500-143421

500-142158

Instrument ID: Lab File ID:

CMS23

Prep Method: Dilution:

Prep Date:

1.0

Analysis Date:

03/16/2012 1722 03/02/2012 0915 Initial Weight/Volume: Final Weight/Volume:

44539-1.d 1050 mL

1.0 mL

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.8		0.92	4.8
Indeno[1,2,3-cd]pyrene	<0.24		0.080	0.24
Isophorone	<1.9		0.28	1.9
2-Methylnaphthalene	<0.48 US		0.12	0.48
2-Methylphenol	<1.9		0.30	1.9
3 & 4 Methylphenol	<1.9 🗸 🖰		0.42	1.9
Naphthalene	<0.95		0.29	0.95
2-Nitroaniline	<4.8		1.0	4.8
3-Nitroaniline	<9.5		2.2	9.5
4-Nitroaniline	<9.5		3.7	9.5
Vitrobenzene	<0.95		0.43	0.95
2-Nitrophenol	<9.5		2.0	9.5
4-Nitrophenol	<19 Uづ		2.2	19
N-Nitrosodiphenylamine	<0.95 ひづ		0.32	0.95
N-Nitrosodi-n-propylamine	<0.48		0.13	0.48
Pentachlorophenol	<9.5		5.3	9.5
Phenanthrene	<0.95 0づ		0.33	0.95
Phenol	<4.8		0.34	4.8
	<0.95		0.46	0.95
Pyrene	<1.9		0.29	1.9
1,2,4-Trichlorobenzene	<9.5		2.2	9.5
2,4,5-Trichlorophenol 2,4,6-Trichlorophenol	<4.8 Vづ		1.0	4.8

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	37		20 - 110
Phenol-d5	25		10 - 115
Nitrobenzene-d5	70		40 - 110
2-Fluorobiphenyl	70		50 - 110
2,4,6-Tribromophenol	79		40 - 125
Terphenyl-d14	92		50 - 135

Client Sample ID:

JP-M13-GWMW362

Lab Sample ID:

500-44539-2

Client Matrix:

Water

Date Sampled: 02/29/2012 1120 Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:

8270C

Analysis Batch:

500-143421

Instrument ID:

CMS23

Prep Method: Dilution:

3510C 1.0

Prep Batch: 500-142158 Lab File ID: Initial Weight/Volume: 44539-2.d 1070 mL

Analysis Date:

Final Weight/Volume:

1.0 mL

Prep Date:

03/16/2012 1742 03/02/2012 0915

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93 US		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
• •	<0.93 US		0.30	0.93
Anthracene Benzidine	<37		19	37
	<19 US		4.3	19
Benzoic acid	<0.19 5		0.041	0.19
Benzo[a]anthracene	<0.19		0.054	0.19
Benzo[b]fluoranthene	<0.23 VS		0.069	0.23
Benzo[k]fluoranthene	<0.93		0.39	0.93
Benzo[g,h,i]perylene	<0.19		0.052	0.19
Benzo[a]pyrene	<19		2.9	19
Benzyl alcohol	<1.9		0.28	1.9
Bis(2-chloroethoxy)methane	<1.9		0.33	1.9
Bis(2-chloroethyl)ether	<1.9		0.28	1.9
2,2'-oxybis[1-chloropropane]	<9.3 <i>౮</i> ≶		2.3	9.3
Bis(2-ethylhexyl) phthalate	<4.7		0.85	4.7
4-Bromophenyl phenyl ether			0.25	1.9
Butyl benzyl phthalate	<1.9		0.93	4.7
Carbazole	<4.7 \ V		2.0	9.3
4-Chloroaniline	<9.3		2.1	9.3
4-Chloro-3-methylphenol	<9.3		0.32	1.9
2-Chloronaphthalene	<1.9 VS			4.7
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl pheлуl ether	<4.7 <i>V</i> S		0.76	0.47
Chrysene	<0.47		0.13 0.060	0.28
Dibenz(a,h)anthracene	<0.28			1.9
Dibenzofuran	<1.9		0.33	4.7
Di-n-butyl phthalate	<4.7		0.75	1.9
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	4.7
3,3'-Dichlorobenzidine	<4.7		0.88	
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3 VS		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19	_	4.6	19
2,4-Dinitrophenol	<19 ઇ ડ	^	6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93 VS		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	ح _{0.47} کک		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7
TestAmerica Chicago	Page 39 of 103	7	ceylo	03/22/2012

Client Sample ID:

JP-M13-GWMW362

Lab Sample ID: Client Matrix:

500-44539-2

Water

Date Sampled: 02/29/2012 1120

Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:

8270C

Analysis Batch:

500-143421

Instrument ID:

CMS23

Prep Method: Dilution:

3510C

Prep Batch:

500-142158

Lab File ID: Initial Weight/Volume: 44539-2.d

1.0

Final Weight/Volume:

1070 mL

Analysis Date: Prep Date:

03/16/2012 1742 03/02/2012 0915

Injection Volume:

1.0 mL 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 🗸		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9 いろ		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	ح ₁₉ حج		2.2	19
N-Nitrosodiphenylamine	<0.93 <i>I</i> S		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
	<0.93		0.45	0.93
Pyrene	<1.9		0.28	1.9
1,2,4-Trichlorobenzene	<9.3		2.1	9.3
2,4,5-Trichlorophenol 2,4,6-Trichlorophenol	<4.7 VS		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	33		20 - 110
Phenol-d5	22		10 - 115
Nitrobenzene-d5	62		40 - 110
2-Fluorobiphenyl	63		50 - 110
2,4,6-Tribromophenol	75		40 - 125
Terphenyl-d14	85		50 - 135

Client Sample ID:

JP-M13-GWMW806

Lab Sample ID:

500-44539-3

Water Client Matrix:

Date Sampled: 02/29/2012 1300 Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:

8270C

Analysis Batch:

500-143421

Instrument ID: Lab File ID:

CMS23 44539-3.d

Prep Method: Dilution:

3510C 1.0

Prep Batch: 500-142158

Initial Weight/Volume: Final Weight/Volume:

1070 mL 1.0 mL

Analysis Date:

03/16/2012 1802

Injection Volume:

1 uL

Prep Date:

03/02/2012 0915

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93 <i>び</i> S		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	حرب 0.93×		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	خ <u>ا</u> ع 19		4.3	19
Benzojajanthracene	0.13 🕓	J	0.041	0.19
Benzo[b]fluoranthene	0.15	J	0.054	0.19
Benzo[k]fluoranthene	0.17 🔰	J	0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	0.16	J	0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	ک <i>ې</i> _{9.3>}		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7₩		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9 ্		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	خ4.7 کک		0.76	4.7
Chrysene	0.13	J	0.13	0.47
Dibenz(a,h)anthracene	0.18	J	0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	· <1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
•	<9.3		2.1	9.3
2,4-Dichlorophenol	<1.9		0.41	1.9
Diethyl phthalate	<9.3 ডঠ		3.1	9.3
2,4-Dimethylphenol	<1.9		0.36	1.9
Dimethyl phthalate	<19		4.6	19
4,6-Dinitro-2-methylphenol	<19 U S	۸	6.9	19
2,4-Dinitrophenol	<1.3		0.28	1,3
2,4-Dinitrotoluene	<0.47		0.11	0.47
2,6-Dinitrotoluene	<9.3		2.3	9.3
Di-n-octyl phthalate	<0.93		0.30	0.93
Fluoranthene	<0.93 V		0.36	0.93
Fluorene	<4.7		0.65	4.7
1,2-Diphenylhydrazine	<0.47 VS		0.13	0.47
Hexachlorobenzene	<4.7		1.0	4.7
Hexachlorobutadiene	~4.1		.,.	. 1 -

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Ceulo 1203/22/2012

Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW806

Lab Sample ID:

500-44539-3

Client Matrix:

Water

Date Sampled: 02/29/2012 1300

Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:

8270C

Analysis Batch:

500-143421

instrument ID:

CMS23

Prep Method: Dilution:

3510C

Prep Batch:

500-142158

Lab File ID: Initial Weight/Volume: 44539-3.d 1070 mL

Analysis Date:

1.0

1.0 mL

Prep Date:

03/16/2012 1802 03/02/2012 0915 Final Weight/Volume: Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	0.17	J	0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	ک <i>ن</i> _{0.47>}		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	خ _{1.9} ک		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
	<9.3		2.0	9.3
2-Nitrophenol	<19 VS		2,2	19
4-Nitrophenol	حرب _{<0.93} مرب		0.32	0.93
N-Nitrosodiphenylamine	<0.47		0.13	0.47
N-Nitrosodi-n-propylamine	<9.3		5.2	9.3
Pentachiorophenoi	<0.93 V		0.33	0.93
Phenanthrene			0.34	4.7
Phenol	<4.7		0.45	0.93
Pyrene	<0.93			1.9
1,2,4-Trichlorobenzene	<1.9		0.28	
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2.4.6-Trichlorophenol	<4.7 ઈ ડ		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	32		20 - 110
Phenol-d5	21		10 - 115
Nitrobenzene-d5	59		40 - 110
2-Fluorobiphenyl	59		50 - 110
2,4,6-Tribromophenol	75		40 - 125
Terphenyl-d14	86		50 - 135

2,4,6-Trichlorophenol

Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW807

Lab Sample ID:

500-44539-4

Client Matrix:

Water

Date Sampled: 02/29/2012 1350

Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:

8270C

Analysis Batch:

500-143421

Instrument ID:

CMS23

Prep Method: Dilution:

3510C

Prep Batch:

500-142158

Lab File ID:

44539-4.d

Analysis Date:

1.0

Initial Weight/Volume: Final Weight/Volume: 1070 mL 1.0 mL

Prep Date:

03/16/2012 1822 03/02/2012 0915

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93 <i>O</i> S		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	کی _{0.93} >		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19 JS		4.3	19
Benzo[a]anthracene	خک _{0.19} <		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23 ک ^۲		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	کک _{9.3} ح		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7 ✓		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	کرے 1.9>		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7 US		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1.3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	کک _{1.9>}		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4.6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenoi	ک ^ر ₁₉ ×	٨	6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93 ♂		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	ح _{0.47} ک		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

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Culio 1203/22/2012

Client Sample ID:

JP-M13-GWMW807

Lab Sample ID:

500-44539-4

Client Matrix:

Water

Date Sampled: 02/29/2012 1350

Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method: Prep Method:

8270C

3510C

1.0

Analysis Date: Prep Date:

Dilution:

03/16/2012 1822 03/02/2012 0915 Analysis Batch: Prep Batch:

500-143421

500-142158

Instrument ID:

Lab File ID:

CMS23 44539-4.d 1070 mL

Initial Weight/Volume: Final Weight/Volume:

1.0 mL

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL	
Hexachloroethane	<4.7		0.91	4.7	
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23	
Isophorone	<1.9		0.27	1.9	
2-Methylnaphthalene	ح _{0.47} کا		0.12	0.47	
2-Methylphenol	<1.9		0.29	1.9	
3 & 4 Methylphenol	د <i>ک</i> 1.9×		0.41	1.9	
Naphthalene	<0.93		0.28	0.93	
2-Nitroaniline	<4.7		1.0	4.7	
3-Nitroaniline	<9.3		2.1	9.3	
4-Nitroaniline	<9.3		3.7	9.3	
Nitrobenzene	<0.93		0.42	0.93	
2-Nitrophenol	<9.3		2.0	9.3	
4-Nitrophenol	رکن 19>		2.2	19	
N-Nitrosodiphenylamine	<0.93 <i>O</i> S		0.32	0.93	
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47	
Pentachlorophenol	<9.3		5.2	9.3	
Phenanthrene	o.93 کک		0.33	0.93	
Phenoi	<4.7		0.34	4.7	
	<0.93		0.45	0.93	
Pyrene 1,2,4-Trichlorobenzene	<1.9		0.28	1.9	
• •	<9.3		2.1	9.3	
2,4,5-Trichtorophenol 2,4,6-Trichtorophenol	<4.7 US		1.0	4.7	

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	34		20 - 110
Phenol-d5	23		10 - 115
Nitrobenzene-d5	64		40 - 110
2-Fluorobiphenyl	67		50 - 110
2,4,6-Tribromophenol	79		40 - 125
Terphenyl-d14	87		50 - 135

Client Sample ID:

JP-M13-GWMW809

Lab Sample ID: Client Matrix:

500-44539-5

Water

Date Sampled: 02/29/2012 1700

Date Received: 03/01/2012 0947

8270C	SVOC

Analysis Method:

8270C

Analysis Batch:

500-143421

Instrument ID:

CMS23

Prep Method: Dilution:

3510C 1.0

Prep Batch:

500-142158

Lab File ID: Initial Weight/Volume: 44539-5.d 1070 mL

Analysis Date:

03/16/2012 1842

Final Weight/Volume:

1.0 mL

Prep Date:

03/02/2012 0915

1 uL Injection Volume:

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93 VS		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	حکن _{0.93} >		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19 US		4.3	19
Benzo[a]anthracene	دک _{0.19} >		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	حرب _{<0.23} حرب		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3 いろ		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7 ✓		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9 グ		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7 U S		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9,3 ഗ		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19 U S	٨	6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2.6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	ح _{0.93} ک		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47 √5		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

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OUND 03/22/2012

Client Sample ID:

JP-M13-GWMW809

Lab Sample ID:

500-44539-5

Client Matrix:

Water

Date Sampled: 02/29/2012 1700

Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method: Prep Method:

8270C

3510C

1.0

Analysis Date: Prep Date:

Dilution:

03/16/2012 1842 03/02/2012 0915 Analysis Batch: Prep Batch:

500-143421

500-142158

Instrument ID:

Lab File ID: Initial Weight/Volume: CMS23 44539-5.d 1070 mL

Final Weight/Volume: Injection Volume:

1.0 mL 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachioroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	خ ^{0.47} خ		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9 <mark>が</mark>		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19 VS ,		2.2	19
N-Nitrosodiphenylamine	حل 0.93ح		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
	<9.3		5.2	9.3
Pentachlorophenol	<0.93 VS		0.33	0.93
Phenanthrene	<4.7		0.34	4.7
Phenol	<0.93		0.45	0.93
Pyrene			0.28	1.9
1,2,4-Trichlorobenzene	<1.9		2.1	9.3
2,4,5-Trichlorophenol	<9.3		1,0	4.7
2,4,6-Trichlorophenol	<4.7 び>		1,0	4.1

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	31		20 - 110
Phenol-d5	20		10 - 115
Nitrobenzene-d5	62		40 - 110
2-Fluorobiphenyl	64		50 - 110
2,4,6-Tribromophenol	64		40 - 125
Terphenyl-d14	90		50 - 135

Client Sample ID:

JP-M13-GWMW999

Lab Sample ID:

500-44539-6

Client Matrix:

Water

Date Sampled: 02/29/2012 1200

Date Received: 03/01/2012 0947

8270C SVOC

Result (ug/L)

Analysis Method:

8270C

Analysis Batch:

500-143421

Instrument ID:

CMS23

Prep Method: Dilution:

3510C

Prep Batch:

Lab File ID: Initial Weight/Volume:

MDL

44539-6.d 1070 mL

1.0

500-142158

Final Weight/Volume:

1.0 mL

Analysis Date:

03/16/2012 2002

Injection Volume:

Qualifier

1 uL

RL

Prep Date:

Analyte

03/02/2012 0915

<0.93 ♂S 0.34 0.93 Acenaphthene 1.3 9.3 <9.3 N-Nitrosodimethylamine 0.93 < 0.93 0.30 Acenaphthylene کی _{0.93}>> 0.30 0.93 Anthracene 19 37 <37 Benzidine <19 が 4.3 19 Benzoic acid 0.041 0.19 <0.19 *ひ*ろ Benzo[a]anthracene 0.054 0.19 < 0.19 Benzo[b]fluoranthene کن 0.23> 0.069 0.23 Benzo[k]fluoranthene 0.93 0.39 < 0.93 Benzo[g,h,i]perylene 0.052 0.19 < 0.19 Benzo[a]pyrene 19 2.9 <19 Benzyl alcohol <1.9 0.28 1.9 Bis(2-chloroethoxy)methane 1.9 <1.9 0.33 Bis(2-chloroethyl)ether 0.28 1.9 <1.9 2,2'-oxybis[1-chloropropane] *حن* 9.3> 9.3 2.3 Bis(2-ethylhexyl) phthalate 4.7 0.85 <4.7 4-Bromophenyl phenyl ether 0.25 1,9 <1.9 Butyl benzyl phthalate 0.93 4.7 <4.7 Carbazole 2.0 9.3 <9.3 4-Chloroaniline 9.3 2.1 4-Chloro-3-methylphenol <9.3 <1.9 ن∑ 0.32 1.9 2-Chloronaphthalene 0.75 4.7 <4.7 2-Chlorophenol <4,7 VS 0.76 4.7 4-Chlorophenyl phenyl ether 0.13 0.47 <0.47 Chrysene 0.060 0.28 < 0.28 Dibenz(a,h)anthracene 0.33 1.9 <1.9 Dibenzofuran 0.75 4.7 <4.7 Di-n-butyl phthalate 0.27 1.9 <1.9 1,2-Dichlorobenzene <1.9 0.23 1.9 1,3-Dichlorobenzene 0.25 1.9 <1.9 1,4-Dichlorobenzene 88.0 4.7 <4.7 3,3'-Dichlorobenzidine 2.1 9.3 <9.3 2,4-Dichlorophenol 0.41 1.9 < 1.9 Diethyl phthalate <9.3 V 3.1 9.3 2,4-Dimethylphenol 0.36 1.9 <1.9 Dimethyl phthalate 4.6 19 <19 4,6-Dinitro-2-methylphenol خان 19 حام 19 6.9 2,4-Dinitrophenol 0.28 1.3 <1.3 2,4-Dinitrotoluene 0.47 < 0.47 0.11 2,6-Dinitrotoluene 2.3 9.3 <9.3 Di-n-octyl phthalate 0.30 0.93 < 0.93 Fluoranthene حرر 93.05× 0.93 0.36 Fluorene 0.65 4.7 <4.7 1,2-Diphenylhydrazine <0.47 کا 0.13 0.47 Hexachlorobenzene 4.7 1.0 <4.7 Hexachlorobutadiene

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JUN 103/22/2012

TestAmerica Chicago

Client Sample ID:

JP-M13-GWMW999

Lab Sample ID:

500-44539-6

Client Matrix:

Water

Date Sampled: 02/29/2012 1200

Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method:

8270C

Analysis Batch:

500-143421

instrument ID: Lab File ID:

CMS23

Prep Method: Dilution:

3510C 1.0

Prep Batch:

500-142158

Initial Weight/Volume: Final Weight/Volume:

44539-6.d 1070 mL

Analysis Date:

03/16/2012 2002

1.0 mL 1 uL

Prep Date:

03/02/2

2012 0915	Injection Volume

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 US		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9 VS		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19 vS		2.2	19
	<0.93 05		0.32	0.93
N-Nitrosodiphenylamine	<0.47		0.13	0.47
N-Nitrosodi-n-propylamine	<9.3		5.2	9.3
Pentachlorophenol	<0.93 <i>U</i> S		0.33	0.93
Phenanthrene	<4.7		0.34	4.7
Phenol	<0.93		0.45	0.93
Pyrene			0.28	1.9
1,2,4-Trichlorobenzene	<1.9		2,1	9:3
2,4,5-Trichlorophenol	<9.3			4.7
2,4,6-Trichlorophenol	<4.7 (5)		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	34		20 - 110
Phenol-d5	23		10 - 115
Nitrobenzene-d5	62		40 - 110
2-Fluorobiphenyl	64		50 - 110
2,4,6-Tribromophenol	69		40 - 125
Terphenyl-d14	90		50 - 135

2,4,6-Trichlorophenol

Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW808

Lab Sample ID:

500-44539-7

Client Matrix:

Water

Date Sampled: 02/29/2012 1510

Date Received: 03/01/2012 0947

8270	C	sv	OC

Analysis Method:

8270C

Analysis Batch:

500-143421

Instrument ID:

CMS23

Prep Method: Dilution:

3510C

Prep Batch:

500-142158

Lab File ID: Initial Weight/Volume: 44539-7.d

1.0

Final Weight/Volume:

1070 mL 1.0 mL

Analysis Date:

03/16/2012 2022

Injection Volume:

Prep Date:

03/02/2012 0915

1 uL

Analyte		injection volune.			
	Result (ug/L)	Qualifier	MDL	RL	
Acenaphthene	<0.93 <i>U</i> S		0.34	0.93	
N-Nitrosodimethylamine	<9.3		1.3	9.3	
Acenaphthylene	<0.93		0.30	0.93	
Anthracene	حرب _{0.93} ×		0.30	0.93	
Benzidine	<37		19	37	
Benzoic acid	ک <i>ر</i> 19×		4.3	19	
Benzo[a]anthracene	<0.19 ৩ ১		0.041	0.19	
Benzo[b]fluoranthene	<0.19		0.054	0.19	
Benzo[k]fluoranthene	حرر _{0.23} حرک		0.069	0.23	
Benzo[g,h,i]perylene	<0.93		0.39	0.93	
Benzo[a]pyrene	<0.19		0.052	0.19	
Benzyl alcohol	<19		2.9	19	
Bis(2-chloroethoxy)methane	<1.9		0,28	1.9	
Bis(2-chloroethyl)ether	<1.9		0.33	1.9	
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9	
	ج _{9.3} ح		2.3	9.3	
Bis(2-ethylhexyl) phthalate	<4.7		0.85	4.7	
4-Bromophenyl phenyl ether	<1.9		0.25	1.9	
Butyl benzyl phthalate	<4.7		0.93	4.7	
Carbazole			2.0	9.3	
4-Chloroaniline	<9.3 <9.3		2.1	9.3	
4-Chloro-3-methylphenol	<9.3 <1.9 び		0.32	1.9	
2-Chloronaphthalene			0.32	4.7	
2-Chlorophenol	<4.7 <4.7 √ S		0.76	4.7	
4-Chlorophenyl phenyl ether				0.47	
Chrysene	<0.47		0.13	0.47	
Dibenz(a,h)anthracene	<0.28		0.060		
Dibenzofuran	<1.9		0.33	1.9	
Di-n-butyl phthalate	<4.7		0.75	4.7	
1,2-Dichlorobenzene	<1.9		0.27	1.9	
1,3-Dichlorobenzene	<1.9		0.23	1.9	
1,4-Dichlorobenzene	<1.9		0.25	1.9	
3,3'-Dichlorobenzidine	<4.7		0.88	4.7	
2,4-Dichlorophenol	<9.3		2.1	9.3	
Diethyl phthalate	<1.9		0.41	1.9	
2,4-Dimethylphenol	<9.3 ♂S		3.1	9.3	
Dimethyl phthalate	<1.9		0.36	1.9	
4,6-Dinitro-2-methylphenol	<19		4.6	19	
2,4-Dinitrophenol	حرب ₁₉	٨	6.9	19	
2,4-Dinitrotoluene	<1.3		0.28	1,3	
2,6-Dinitrotoluene	<0.47		0.11	0.47	
Di-n-octyl phthalate	<9.3		2.3	9.3	
Fluoranthene	<0.93		0.30	0.93	
Fluorene	کۍ _{0.93} >		0.36	0.93	
1,2-Diphenylhydrazine	<4.7		0.65	4.7	
Hexachlorobenzene	<0.47 5		0.13	0.47	
Hexachlorobutadiene	<4.7		1.0	4.7	
, ICAGGINO CODIGORONO	•••				

TestAmerica Chicago

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JUNA 122/2012

Job Number: 500-44539-1 Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMW808

Lab Sample ID:

500-44539-7

Client Matrix:

Water

Date Sampled: 02/29/2012 1510 Date Received: 03/01/2012 0947

8270C SVOC

Analysis Method: Prep Method:

8270C

3510C

1.0

Analysis Date: Prep Date:

Dilution:

03/16/2012 2022 03/02/2012 0915

Analysis Batch: Prep Batch:

500-143421

500-142158

Instrument ID: Lab File ID:

CMS23

10 - 115

40 - 110

50 - 110

40 - 125

50 - 135

Initial Weight/Volume: Final Weight/Volume: 44539-7.d 1070 mL 1.0 mL

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier MDL RL			
Hexachioroethane	<4.7		0.91	4.7	
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23	
Isophorone	<1.9		0.27	1.9	
2-Methylnaphthalene	<0.47 ♂5		0.12	0.47	
2-Methylphenol	<1.9		0.29	1.9	
3 & 4 Methylphenol	خ _{1.9} کا		0.41	1.9	
Naphthalene	<0.93		0.28	0.93	
2-Nitroaniline	<4.7		1.0	4.7	
3-Nitroaniline	<9.3		2.1	9.3	
4-Nitroaniline	<9.3		3.7	9.3	
Nitrobenzene	<0.93		0.42	0.93	
2-Nitrophenol	<9.3		2.0	9.3	
4-Nitrophenol	<19 v5		2.2	19	
N-Nitrosodiphenylamine	<0.93 Ư		0.32	0.93	
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47	
Pentachlorophenol	<9.3	5.2		9.3	
Phenanthrene	حرن _{0.93} ح		0.33	0.93	
Phenol	<4.7		0.34	4.7	
Pyrene	<0.93		0.45	0.93	
1,2,4-Trichlorobenzene	<1.9		0.28	1.9	
2,4,5-Trichlorophenol	<9.3		2.1	9.3	
2,4,6-Trichlorophenol	<4.7 VS		1.0	4.7	
Surrogate	%Rec	Qualifier	Accepta	nce Limits	
2-Fluorophenol	41		20 - 110		
•			40 445		

29

74

82

93

80

Phenol-d5

Nitrobenzene-d5

2-Fluorobiphenyl

Terphenyl-d14

2,4,6-Tribromophenol

LDC #: 27391A2 VALIDATION COMPLETENESS WORKSHEET SDG #: 500-44539-1 Level III Laboratory: Test America, Inc.

Date:	4/4/12
Page:_	(of)
Reviewer:	BR
2nd Reviewer:	<u>~</u>

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area	·	Comments
l.	Technical holding times	A	Sampling dates: $\delta Z 2 \gamma (2$
li.	GC/MS instrument performance check	4	,
111.	Initial calibration	SM	KCD = 30/152, 52
IV.	Continuing calibration/ICV	SW	1CV/CCV = 287
V.	Blanks	A	
VI.	Surrogate spikes	Ą	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	Ą	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	ND	FD = 576
XVII.	Field blanks	N	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate
TB = Trip blank

TB = Trip blank EB = Equipment blank

Validated Samples: Water

					_	
1	JP-M13-GWMW126R	11	500-142158-MB	21	 31	
2	JP-M13-GWMW362	12		22	32	
3	JP-M13-GWMW806	13		23	33	
4	JP-M13-GWMW807	14		24	 34	
5	JP-M13-GWMW809	15		25	35	
6	JP-M13-GWMW999	16		26	36	
7	JP-M13-GWMW808	17		27	37	
88	JP-M13-GWMW808MS	18		28	38	
9	JP-M13-GWMW808MSD	19		29	39	
10		20		30	40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroanlline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chiorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butyiphthalate	MMM. Bis(2-Chlorolsopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
1.4 Methymenol 3 54 Methyl-	. X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ, Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methy/phenoi	EEE. Bis(2-ethylhexyi)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octyphithalate**	ດດດ
N. 2-Nitrophenol**	CC. Dimethylphthalete	RR, 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	ww.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluòranthene	www.

Notes:* = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

LDC #: 27311 hz

VALIDATION FINDINGS WORKSHEET Initial Calibration 2nd Reviewer:

Page: Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Plgase see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Did the laboratory conduct an acceptable 5 point calibration prior to sample analysis?

Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?

Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?

Did the initial calibration meet the acceptance criteria? Were all %RSDs and RRFs within the validation criteria of $\le 30\%$ %RSD and ≥ 0.05 RRF?

S N N/A

Qualifications	5/43/4																			
Associated Samples	VI																		•	4
Finding RRF (Limit: >0.05)																•				
Finding %RSD (Limit: <30.0%) (5-4	0.71	25.0	(6.0	18. d	20.0					,			-				•	-	·	
Compound	Ţ	PPF	MN	AAA	ÉEE	ትተተ														
Standard ID	1CAL -CMS23																			
Date	21 21 29																			
*																				

2739142 LDC#:

SDG#: Sec and

N N/A

VALIDATION FINDINGS WORKSHEET Continuing Calibration

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Was a continuing calibration standard analyzed at least once every 12 hours of sample analyzed.

Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument? Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ? Were all %D and RRFs within the validation criteria of ≤26 %D and ≥0.05 RRF?

Qualifications F2 / 12 Associated Samples Finding RRF (Limit: >0.05) Finding %D 2.0 (Limit: <25.0%) 23.4 3.8 20.5 25. P 24.0 21.7 21.2 21.9 21.5 28.7 26.5 22.1 20.5 21.3 23.8 Compound CCC ええ 3 ろろろ **8** K RR II ¥¥ SS GG 3 کے す -CM823 Standard ID 100 <u>5</u> Date Y A) N/A *

LDC #: 273 11 A2 SDG #: PCC CON

Matrix Spike/Matrix Spike Duplicates VALIDATION FINDINGS WORKSHEET

Page: Reviewer: 2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water. Ø N N/A

Was a MS/MSD analyzed every 20 samples of each matrix? Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

(A) N/A

24 (55- 10)
35) () () () () () () () () () (
35-) (
3

	Compound	QC Limits (Soll)	RPD (Soll)	QC Limits (Water)	RPD (Water)		. Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
Ä.	Phenol	26-90%	≥ 35%	12-110%	< 42%	G.	Acenaphthene	31-137%	<u>< 19%</u>	46-118%	≥ 31%
ن	2-Chlorophenol	25-102%	< 50%	27-123%	≥ 40%	≕	4-Nitrophenol	11-114%	< 50%	10-80%	< 50%
ш	1,4-Dichlorobenzene	28-104%	< 27%	. 36-97%	≥ 28%	폿	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	×38%
ŗ	N-Nitroso-di-n-propylamine	41-126%	< 38%	41-116%	≥ 38%	Ë	Pentachiorophenol	17-109%	< 47%	9-103%	× 20%
ц.	1,2,4-Trichlorobenzene	38-107%	< 23%	39-98%	≥ 28%	72.	Pyrene	35-142%	≥ 36%	26-127%	< 31%
>	4-Chloro-3-methylphenol	26-103%	≥ 33%	23-97%	< 42%						

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: February 29, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Dissolved Metals

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44539-1

Sample Identification

JP-M13-GWMW126R

JP-M13-GWMW362

JP-M13-GWMW806

JP-M13-GWMW807

JP-M13-GWMW809

JP-M13-GWMW999

JP-M13-GWMW808

JP-M13-GWMW808MS

JP-M13-GWMW808MSD

JP-M13-GWMW808DUP

Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B and 7470A for Dissolved Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

ICP-MS was not utilized in this SDG.

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No dissolved metal contaminants were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Antimony Barium Lead	0.00357 mg/L 0.000520 mg/L 0.00175 mg/L	All samples in SDG 500-44539-1

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
JP-M13-GWMW126R	Lead	0.0016 mg/L	0.0016U mg/L
JP-M13-GWMW362	Antimony Lead	0.0035 mg/L 0.0016 mg/L	0.0035U mg/L 0.0016U mg/L
JP-M13-GWMW807	Antimony Lead	0.0030 mg/L 0.0017 mg/L	0.0030U mg/L 0.0017U mg/L
JP-M13-GWMW809	Antimony	0.0028 mg/L	0.0028U mg/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
JP-M13-GWMW999	Antimony Lead	0.0031 mg/L 0.0016 mg/L	0.0031U mg/L 0.0016U mg/L
JP-M13-GWMW808	Antimony	0.0033 mg/L	0.0033U mg/L

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
JP-M13-GWMW808	Potassium	12 (≤10)	All samples in SDG 500-44539-1	J (all detects) UJ (all non-detects)	A

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

Samples JP-M13-GWMW809 and JP-M13-GWMW999 were identified as field duplicates. No dissolved metals were detected in any of the samples with the following exceptions:

	Concentrat	ion (mg/L)				
Analyte	JP-M13-GWMW809	JP-M13-GWMW999	RPD (Limits)	Difference (Limits)	Flags	A or P
Antimony	0.0028	0.0031	u	0.0003 (≤0.040)	-	-
Barium	0.031	0.031	-	0 (≤0.020)	-	-
Calcium	41	40	2 (≤25)	-	-	-
Lead	0.0050U	0.0016	-	0.0034 (≤0.0100)	-	_
Magnesium	31	31	0 (≤25)	-	-	
Manganese	0.0055	0.0059	7 (≤25)	•	-	-
Potassium	2.6	2.6	0 (≤25)	-	-	-
Sodium	19	19	0 (≤25)	-	-	-
Vanadium	0.0022	0.0024	-	0.0002 (≤0.0100)	-	-

JOAAP-GW Dissolved Metals - Data Qualification Summary - SDG 500-44539-1

SDG	Sample	Analyte	Flag	A or P	Reason
500-44539-1	JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW806 JP-M13-GWMW809 JP-M13-GWMW999 JP-M13-GWMW808	Potassium	J (all detects) UJ (all non-detects)	А	ICP serial dilution (%D)

JOAAP-GW Dissolved Metals - Laboratory Blank Data Qualification Summary - SDG 500-44539-1

SDG	Sample	Analyte	Modified Final Concentration	A or P
500-44539-1	JP-M13-GWMW126R	Lead	0.0016U mg/L	А
500-44539-1	JP-M13-GWMW362	Antimony Lead	0.0035U mg/L 0.0016U mg/L	А
500-44539-1	JP-M13-GWMW807	Antimony Lead	0.0030U mg/L 0.0017U mg/L	А
500-44539-1	JP-M13-GWMW809	Antimony	0.0028U mg/L	Α
500-44539-1	JP-M13-GWMW999	Antimony Lead	0.0031U mg/L 0.0016U mg/L	А
500-44539-1	JP-M13-GWMW808	Antimony	0.0033U mg/L	Α .

JOAAP-GW

Dissolved Metals - Field Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

Job Number: 500-44539-1 Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMW126R

Lab Sample ID: Client Matrix:

500-44539-1

Water

Date Sampled: 02/29/2012 1000

Date Received: 03/01/2012 0947

6010B Metals (ICP)-Dissolved

Analysis Method:

6010B 3010A

Prep Method: Dilution:

1.0

Analysis Date: Prep Date:

03/02/2012 1134 03/01/2012 1530 Prep Batch:

Analysis Batch:

500-142211

500-142106

Instrument ID: Lab File ID:

ICP5

Initial Weight/Volume:

P50302A 50 mL

Final Weight/Volume:

50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.055	В	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	67		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	0.0016 U	JВ	0.0016	0.0050
Magnesium	43		0.024	0.10
Manganese	0.0088	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	2.4 3		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	26		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0029	J	0.00062	0.0050
	<0.020	ŭ	0.0047	0.020
Zinc	-0.025			

7470A Mercury (CVAA)-Dissolved

Analysis Method: Prep Method:

7470A 7470A 1.0

03/07/2012 0847

Analysis Date: Prep Date:

03/06/2012 1415

Analysis Batch: Prep Batch:

500-142537 500-142429 Instrument ID: Lab File ID:

HG6 030712R.CSV

Initial Weight/Volume:

25 mL

Final Weight/Volume: 25 mL

Analyte

Dilution:

Qualifier

RL 0.20

MDL Result (ug/L) 0.070 <0.20 Mercury

03/22/2012

Job Number: 500-44539-1 Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMW362

Lab Sample ID:

500-44539-2

Client Matrix:

Water

Date Sampled: 02/29/2012 1120

Date Received: 03/01/2012 0947

6010B Metals (ICP)-Dissolved

Analysis Method:

6010B 3010A

Prep Method: Dilution:

1.0

Analysis Date:

03/02/2012 1156

Prep Date:

03/01/2012 1530

500-142211 Analysis Batch: Prep Batch:

500-142106

Instrument ID:

Lab File ID:

ICP5 P50302A

Initial Weight/Volume:

50 mL

Final Weight/Volume:

50 mL

		Result (mg	/L) Qualifie	er MDL	RL
Analyte			(L) Quality	0.025	0.20
Aluminum		<0.20	JB	0.0026	0.020
Antimony		0.0035 U	JD	0.0024	0.010
Arsenic		<0.010	ь	0.0024	0.010
Barium		0.044	В	0.00044	0.0040
Beryllium		<0.0040			0.0020
Cadmium		<0.0020		0.00054	0.20
Calcium		160		0.087	
Chromium		0.0010	J	0.00096	0.010
Cobalt		0.0011	j	0.0010	0.0050
Copper		<0.010		0.0011	0.010
Iron		<0.20		0.070	0.20
Lead		0.0016 <i>U</i>	JВ	0.0016	0.0050
Magnesium		100		0.024	0.10
Manganese		0.043		0.0011	0.010
Nickel		0.0044	J	0.0019	0.010
Potassium		8.5	<u>-</u>	0.070	0.50
Selenium		< 0.010		0.0027	0.010
Silver		<0,0050		0.0011	0.0050
Thallium		< 0.010		0.0013	0.010
Vanadium		0.0047	J	0.00062	0.0050
Zinc		<0.020		0.0047	0.020
2.110					
Analysis Method:	6010B	Analysis Batch:	500-142619	Instrument ID:	ICP5
-	3010A	Prep Batch:	500-142106	Lab File ID:	P50307B
Prep Method:		i ich paioii	555	Initial Weight/Volume:	50 mL
Dilution:	10			Final Weight/Volume:	50 mL
Analysis Date:	03/07/2012 2039			Final vveigno voidine.	OU THE

7470A Mercury (CVAA)-Dissolved

Analysis Method: Prep Method:

Analysis Date: Prep Date:

Analyte

Sodium

7470A 7470A

1.0 Dilution: 03/07/2012 0849 Analysis Date:

Prep Date:

03/06/2012 1415

03/01/2012 1530

Analysis Batch: Prep Batch:

Result (mg/L)

180

500-142537 500-142429 Instrument ID:

Lab File ID:

HG6 030712R.CSV

RL

10

Initial Weight/Volume: Final Weight/Volume:

MDL

1.2

25 mL

25 mL

Analyte Mercury Result (ug/L)

Qualifier

Qualifier

MDL

RL 0.20

<0.20

0.070

Job Number: 500-44539-1 Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMW806

Lab Sample ID:

500-44539-3

Client Matrix:

Water

Date Sampled: 02/29/2012 1300

Date Received: 03/01/2012 0947

6010B Metals (ICP)-Dissolved

Analysis Method:

6010B 3010A Analysis Batch: Prep Batch:

500-142211 500-142106 Instrument ID: Lab File ID:

ICP5 P50302A

Prep Method: Dilution:

1.0

03/02/2012 1202

Initial Weight/Volume: Final Weight/Volume:

50 mL 50 mL

Analysis Date: Prep Date:

03/01/2012 1530

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.096	В	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	76		0.087	0.20
Chromium	0.00096	J	0.00096	0.010
Cobalt	< 0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	< 0.0050		0.0016	0.0050
Magnesium	46		0.024	0.10
Manganese	0.0017	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	2.1 5		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	24		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0031	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: Prep Method:

7470A 7470A 1.0

Analysis Batch: Prep Batch:

500-142537 500-142429 Instrument ID: Lab File ID:

HG6 030712R.CSV

Initial Weight/Volume:

25 mL

25 mL Final Weight/Volume:

Analysis Date: Prep Date:

03/07/2012 0850 03/06/2012 1415

Result (ug/L)

Qualifier

MDL

RL

Analyte Mercury

Dilution:

<0.20

0.070

0,20

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW807

Lab Sample ID:

500-44539-4

Client Matrix:

Water

Date Sampled: 02/29/2012 1350

Date Received: 03/01/2012 0947

6010B Metals (ICP)-Dissolved

Analysis Method:

6010B 3010A Analysis Batch:

500-142211

Instrument ID:

ICP5

Prep Method: Dilution:

1.0

Prep Batch:

500-142106

Lab File ID: Initial Weight/Volume: P50302A 50 mL

Analysis Date:

03/02/2012 1209

Prep Date:

03/01/2012 1530

Final Weight/Volume:

50 mL

·				
Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	0.026	J	0.025	0.20
Antimony	0.0030 <i>U</i>	JВ	0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.097	В	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	180		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Соррег	<0.010		0.0011	0.010
Iron	0.82		0.070	0.20
Lead	0.0017 V	· JB	0.0016	0.0050
Leau	J.22 Q			

89

14

0.092

0.0021

< 0.010

< 0.0050

< 0.010

0.0040

< 0.020

Analysis Method:

Magnesium

Manganese

Potassium

Selenium

Thallium

Vanadium

Nickel

Silver

Zinc

6010B 3010A

100

Analysis Date:

03/07/2012 2045

Analysis Batch: 500-142619 Prep Batch: 500-142106

5

Instrument ID: Lab File ID:

ICP5 P50307B

0.10

0.010

0.010

0.50

0.010

0.0050

0.010

0.0050

0.020

Initial Weight/Volume: Final Weight/Volume:

12

0.024

0.0011

0.0019

0.070

0.0027

0.0011

0.0013

0.00062

0.0047

50 mL 50 mL

Prep Date:

Prep Method:

Dilution:

Analyte

Sodium

03/01/2012 1530

Result (mg/L) 400

Qualifier

J

J

MDL

RL 100

7470A Mercury (CVAA)-Dissolved

Analysis Method: Prep Method:

7470A 7470A 1.0

Analysis Batch: Prep Batch:

500-142537 500-142429

Instrument ID: Lab File ID:

HG6 030712R.CSV

Initial Weight/Volume: Final Weight/Volume:

25 mL 25 mL

Analysis Date: Prep Date:

Dilution:

03/07/2012 0852

03/06/2012 1415

Result (ug/L)

Qualifier

MDL

RL

Analyte Mercury

0.20

<0.20

0.070

Job Number: 500-44539-1 Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMW809

Lab Sample ID: Client Matrix:

500-44539-5

Water

Date Sampled: 02/29/2012 1700

Date Received: 03/01/2012 0947

6010B Metals (ICP)-Dissoived

Analysis Method:

6010B 3010A

Analysis Batch:

Prep Batch:

500-142211 500-142106 Instrument ID: Lab File ID:

ICP5 P50302A

Prep Method: Dilution:

1.0

Initial Weight/Volume:

50 mL

Analysis Date:

03/02/2012 1215

Final Weight/Volume:

50 mL

Prep Date:

03/01/2012 1530

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0028 U	JB	0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.031	В	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	41		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0,0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	31		0.024	0.10
Manganese	0.0055	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	2.6 5		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	19		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0022	J	0.00062	0.0050
	<0.020	-	0.0047	0.020
Zinc	-0.020			

7470A Mercury (CVAA)-Dissolved

Analysis Method: Prep Method:

7470A 7470A 1.0

Analysis Batch: Prep Batch:

500-142537 500-142429 Instrument ID: Lab File ID:

HG6

030712R.CSV

Initial Weight/Volume: Final Weight/Volume:

25 mL 25 mL

Analysis Date: Prep Date:

03/07/2012 0854 03/06/2012 1415

Result (ug/L)

Qualifier

MDL

RL

Analyte Mercury

Dilution:

<0.20

0.070

0.20

Job Number: 500-44539-1 Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMW999

Lab Sample ID:

500-44539-6

Client Matrix:

Water

Date Sampled: 02/29/2012 1200

Date Received: 03/01/2012 0947

6010B Metals (ICP)-Dissolved

Analysis Method:

6010B 3010A Analysis Batch:

500-142211

Instrument ID:

ICP5 P50302A

Prep Method: Dilution:

1.0

Prep Batch:

500-142106

Lab File ID: Initial Weight/Volume: Final Weight/Volume:

50 mL 50 mL

Analysis Date:

Prep Date:

03/02/2012 1221

03/01/2012 1530

MDL	RL
0.025	0.20
0.0026	0.020
	0.025

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0031 <i>U</i>	JB	0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.031	В	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	40		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	0.0016 U	JB	0.0016	0.0050
Magnesium	31		0.024	0.10
Manganese	0.0059	J	0.0011	0.010
Nickei	<0.010		0.0019	0.010
Potassium	2.6 丁		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	19		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0024	J	0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: Prep Method:

7470A 7470A

Dilution: Analysis Date: Prep Date:

1.0 03/07/2012 0855 03/06/2012 1415 Analysis Batch: Prep Batch:

500-142537 500-142429 Instrument ID: Lab File ID:

HG6

Initial Weight/Volume: Final Weight/Volume:

030712R.CSV 25 mL

25 mL

RL Qualifier MDL Result (ug/L) Analyte 0.20 0.070 < 0.20 Mercury

OMON 03/22/2012

Job Number: 500-44539-1 Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMW808

Lab Sample ID:

500-44539-7

Client Matrix:

Water

Date Sampled: 02/29/2012 1510

Date Received: 03/01/2012 0947

6010B Metals (ICP)-Dissolved

Analysis Method:

6010B 3010A

Prep Method: 1.0 Dilution:

Analysis Date: Prep Date:

03/02/2012 1227

03/01/2012 1530

Analysis Batch: Prep Batch:

500-142211 500-142106 Instrument ID:

Lab File ID:

ICP5 P50302A

Initial Weight/Volume:

50 mL

50 mL Final Weight/Volume:

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	0.0033 U	JB	0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.16	В	0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	120		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	0.0082		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	1.7		0.070	0.20
Lead	< 0.0050		0.0016	0.0050
Magnesium	67		0.024	0.10
Manganese	0.55		0.0011	0.010
Nickel	0.022		0.0019	0.010
Potassium	11 5	٧	0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Thallium	<0.010		0.0013	0.010
Vanadium	0.0040	J	0.00062	0.0050
Zinc	0.0066	J	0.0047	0.020
ZIIIC				

Analysis Method:

6010B 3010A

Prep Method: Dilution:

10

Analysis Date: 03/01/2012 1530 Prep Date:

03/07/2012 2051

Analysis Batch: Prep Batch:

500-142619 500-142106 Instrument ID: Lab File ID:

ICP5 P50307B

Initial Weight/Volume:

50 mL

Final Weight/Volume:

50 mL

MDL RL Qualifier Result (mg/L) Analyte 1.2 10 Sodium

7470A Mercury (CVAA)-Dissolved

Analysis Method: Prep Method:

7470A 7470A

1.0 03/07/2012 0857 Analysis Batch: Prep Batch:

500-142537 500-142429 Instrument ID: Lab File ID:

HG6

Initial Weight/Volume:

030712R.CSV 25 mL

Final Weight/Volume: 25 mL

Analysis Date: Prep Date:

03/06/2012 1415

Result (ug/L)

Qualifier

MDL

Analyte Mercury

Dilution:

<0.20

0.070

0.20

LDC #: 27391A4 VALI SDG #: 500-44539-1 Laboratory: Test America, Inc. METHOD: Dissolved Metals (EPA SW				I	Level II 911:	∯ -	© A	Τ	Date: 4-5-16 Page: 1 of 1 Reviewer: MG 2nd Reviewer:
The sa		e revie						ation find	lings are noted in attached
	Validation	Area					Com	nments	
I.	Technical holding times			Ą	Sampling	dates:	2-29-12	 	
II.	ICP/MS Tune			N	not	ut	ilized		
111,	Calibration			A					
IV.	Blanks			SW					
V.	ICP Interference Check San	nple (IC	S) Analysis	Α					
VI.	Matrix Spike Analysis			A	MS	1 M 51	D		
VII.	Duplicate Sample Analysis			Α	DUG	1			
VIII.	Laboratory Control Samples	(LCS)		Α	LCS				
IX.	Internal Standard (ICP-MS)			7	not	<u>ut</u>	ilized		
X.	Furnace Atomic Absorption	QC		2	łı		ti		
XI.	ICP Serial Dilution			SW	ļ				
XII.	Sample Result Verification			N					
XIII.	Overall Assessment of Data	ì		A					
XIV.	Field Duplicates			SW	D	= 5	+6		
χV	Field Blanks			7					
Note: Validate	A = Acceptable N = Not provided/applicable SW = See worksheet d Samples:	•	R = Rins	o compound sate eld blank	is detected		D = Duplicate TB = Trip blank EB = Equipment b	olank	
1 .	JP-M13-GWMW126R	11			21			31	
	JP-M13-GWMW362	12	-		22			32	
3 .	JP-M13-GWMW806	13			23		·	33	
	JP-M13-GWMW807	14			24			34	
5 .	JP-M13-GWMW809	15	_		25			35	
	JP-M13-GWMW999	16			26			36	
!	JP-M13-GWMW808	17			27			37	
	IP-M13-GWMW808MS	18			28			38	
	IP-M13-GWMW808MSD	19			29			39	

Notes:

30

40

PBW

20

10 JP-M13-GWMW808DUP

LDC#: 07391A4

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page:_	Lof
Reviewer:	MG
2nd reviewer:_	V-

All circled elements are applicable to each sample.

	 1	
Sample ID	<u> Matrix</u>	Target Analyte List (TAL)
1->7	W	(Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zp) Mo, B, Si, CN
008710	Ų į	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zp Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Nì, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN-,
[<u> </u>	Analysis Method
ICP	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn) Hg(Ni, K, Se, Ag, Na, Tl, V, Zn) Mo, B, Si, CN,
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
GEAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN

Comments: Mercury by CVAA if performed

LDC #: 27391A4

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000)

Sample Concentration units, unless otherwise noted: mg/L

VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

Page: of

2nd Reviewer:_ Reviewer:_

Soil preparation factor applied: NA Associated Samples: all

Maximum Maximum PB* (mg/Kg) (mg/L)	- 	Maximum tCB/CCB* (ug/L)	Action Limit	-	2	4	5	9	7		
0.00357			0.01785		0.0035	0:0030	0.0028	0.0031	0.0033		
0.000520	!		0.00260								
0.00175			0.00875	0.0016	0.0016	0.0017		0.0016			

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC# 37391A4

VALIDATION FINDINGS WORKSHEET ICP Serial Dilution

Reviewer: MG Page: ___of_ 2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

(Y)N N/A

(N)N/A

Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data. Were ICP serial dilution percent differences (%D) ≤10%?

Y (M)N/A

Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations. LEVEL IV ONLY: Y N N/A

Date Diluted Sample 10 The determinant Matrix Analyte % Diluted Samples Diluted Samples Associated Samples The determinant of	11							_
7 Water K 18 (±10) all	ı	Dafe	Diluted Sample ID	Analyt	%D (Limits)	Associated Samples	Qualifications	
			2	 :	12 (01)	all	エ/ひゴ/A	
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LDC#: 27391A4

VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

Page:_	<u>of</u>
Reviewer:	MG
2nd Reviewer:	\ <u></u>

METHOD: Metals (EPA Method 6010B/6020/7000)

(YN NA (YN NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentrat	ion (mg/L)	(≤25)	(mg/L)	(mg/L)	Qualifications
Analyte	5	6	RPD	Difference	Limits	(Parent Only)
Antimony	0.0028	0.0031		0.0003	(≤0.040)	
Barium	0.031	0.031		0	(≤0.020)	
Calcium	41	40	2			
Lead	0.0050U	0.0016		0.0034	(≤0.0100)	
Magnesium	31	31	0			
Manganese	0.0055	0.0059	7			
Potassium	2.6	2.6	0			
Sodium	19	19	0			
Vanadium	0.0022	0.0024		0.0002	(≤0.0100)	

V:\FIELD DUPLICATES\FD_inorganic\27391A4.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: February 29, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44539-1

Sample Identification

JP-M13-GWMW126R

JP-M13-GWMW362

JP-M13-GWMW806

JP-M13-GWMW807

JP-M13-GWMW809

JP-M13-GWMW999

JP-M13-GWMW808

JP-M13-GWMW808MS

JP-M13-GWMW808MSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Dissolved Nitrate as Nitrogen and Dissolved Sulfate.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Calibration Verification

Calibration verification frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
ICB/CCB	Sulfate	0.0976 mg/L	JP-M13-GWMW362 JP-M13-GWMW807

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples JP-M13-GWMW809 and JP-M13-GWMW999 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concentra	tion (mg/L)				
Analyte	JP-M13-GWMW809	JP-M13-GWMW999	RPD (Limits)	Difference (Limits)	Flags	A or P
Sulfate	5.9	5.9	0 (≤25)		-	

JOAAP-GW

Wet Chemistry - Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

JOAAP-GW

Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

JOAAP-GW

Wet Chemistry - Field Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

Client: Toltest Inc. Job Number: 500-44539-1

General Chemistry

Client Sample ID:

JP-M13-GWMW126R

Lab Sample ID:

500-44539-1

Client Matrix:

Water

Date Sampled: 02/29/2012 1000

Date Received: 03/01/2012 0947

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Disso	lved 0.12		mg/L	0.023	0.10	1.0	300.0
	Analysis Batch: 500-142165	Analysis Date	: 03/01/2012	2 1215			
Sulfate-Dissolved	53		mg/L	0.90	2.0	10	300.0
	Analysis Batch: 500-142165	Analysis Date	: 03/01/2012	2 1230			

Client: Toltest Inc.

Job Number: 500-44539-1

General Chemistry

Client Sample ID:

JP-M13-GWMW362

Lab Sample ID:

500-44539-2

Client Matrix:

Water

Date Sampled: 02/29/2012 1120

Date Received: 03/01/2012 0947

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Disso	ved <1.0	ing the fightest warmer to the contract of the	mg/L	0.23	1.0	10	300.0
	Analysis Batch: 500-142165	Analysis Date:	: 03/01/201	2 1359			
Sulfate-Dissolved	280		mg/L	4.5	10	50	300.0
	Analysis Batch: 500-143315	Analysis Date:	: 03/15/201:	2 0226			

Client: Toltest Inc.

Job Number: 500-44539-1

General Chemistry

Client Sample ID:

JP-M13-GWMW806

Lab Sample ID:

500-44539-3

Client Matrix:

Water

Date Sampled: 02/29/2012 1300

Date Received: 03/01/2012 0947

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissol	ved 0.39		mg/L	0.023	0.10	1.0	300.0
	Analysis Batch: 500-142165	Analysis Date:	03/01/201	2 1414			
Sulfate-Dissolved	79		mg/L	0.90	2.0	10	300.0
	Analysis Batch: 500-142165	Analysis Date:	: 03/01/201	2 1429			

24/0/1

Client: Toltest Inc. Job Number: 500-44539-1

General Chemistry

Client Sample ID:

JP-M13-GWMW807

Lab Sample ID:

500-44539-4

Client Matrix:

Water

Date Sampled: 02/29/2012 1350

Date Received: 03/01/2012 0947

Analyle	Result	Qual	Units	MDL	RL.	Dil	Method
Nitrate as N-Disso	ved <1.0	manadas policinis un la constitución de desentación	mg/L	0.23	1.0	10	300.0
	Analysis Batch: 500-142165	Analysis Date:	03/01/201	2 1459			
Sulfate-Dissolved	230		mg/L	4.5	10	50	300.0
	Analysis Batch: 500-143315	Analysis Date:	03/15/201	2 0241			

Out 6/12 03/22/2012 Client: Toltest Inc.

Job Number: 500-44539-1

General Chemistry

Client Sample ID:

JP-M13-GWMW809

Lab Sample ID:

500-44539-5

Client Matrix:

Water

Date Sampled: 02/29/2012 1700

Date Received: 03/01/2012 0947

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Disso	lved <0.10		mg/L	0.023	0.10	1.0	300.0
	Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1514					
Sulfate-Dissolved	5.9		mg/L	0.090	0.20	1.0	300.0
	Analysis Batch: 500-142165	Analysis Date:	: 03/01/2012	2 1514			

03/22/2012

Job Number: 500-44539-1 Client: Toltest Inc.

General Chemistry

Client Sample ID:

JP-M13-GWMW999

Lab Sample ID: Client Matrix:

Analyte

500-44539-6

Water

Date Sampled: 02/29/2012 1200

Dil

1.0

Date Received: 03/01/2012 0947

Method

300.0

<0.10 Nitrate as N-Dissolved Analysis Batch: 500-142165

0.023 mg/L Analysis Date: 03/01/2012 1543

Qual

Units

mg/L

0.090

MDL

0.20

RL

0.10

1.0 300.0

Sulfate-Dissolved

Analysis Batch: 500-142165

Result

Analysis Date: 03/01/2012 1543

Client: Toltest Inc. Job Number: 500-44539-1

General Chemistry

Client Sample ID:

JP-M13-GWMW808

Lab Sample ID:

500-44539-7

Client Matrix: Water

Date Sampled: 02/29/2012 1510

Date Received: 03/01/2012 0947

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved <		CONTRACTOR OF STREET	mg/L	0.023	0.10	1.0	300.0
	Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1643					
Sulfate-Dissolved	99		mg/L	0.90	2.0	10	300.0
	Analysis Batch: 500-142165	Analysis Date: 03/01/2012 1657					

03/22/2012

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LDC #: 27391A6	VALIDATION COMPLETENESS WORKSHEET	Date: 4-5-12
SDG #: <u>500-44539-1</u>	_ Level III	Page:of
Laboratory: Test America, Inc.		Reviewer: MG
		2nd Reviewer:

METHOD: Dissolved Nitrate-N, Dissolved Sulfate (EPA Method 300.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
i.	Technical holding times	A	Sampling dates: $2 - 29 - 12$
Ш	Initial calibration	Α	
111,	Calibration verification	Α	
IV	Blanks	SW	
V	Matrix Spike/Matrix Spike Duplicates	A	MS/MSD
VI.	Duplicates	7	
VII.	Laboratory control samples	Α	LCS
VIII.	Sample result verification	N	
IX.	Overall assessment of data	Α	
X.	Field duplicates	SW	D= 5+6
XI	Field blanks	2	

Note: A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate FB = Field blank

D = Duplicate TB = Trip blank EB = Equipment blank

Validated Samples:

	all water					·····
1	JP-M13-GWMW126R	11		21	 31_	
2	JP-M13-GWMW362	12		22	32	
3	JP-M13-GWMW806	13		23	 33	
4	JP-M13-GWMW807	14		24	34	
5	JP-M13-GWMW809	15		25	35	
6	JP-M13-GWMW999	16		26	36	
7	JP-M13-GWMW808	17		27	37	
8	JP-M13-GWMW808MS	18		28	38	
9	JP-M13-GWMW808MSD	19	PBWI	29	39	
10		20	PBW2	30	40	

Notes:	
_	

LDC#: 27391A6

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	
Reviewer:	MG
2nd reviewer:	

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1-77	W	pH TDS CI F (NO3)NO2 (SO4)PO4 ALK CN NH3 TKN TOC CR6+ CIO4
0c g,9	₽	pH TDS CI F (NO) NO, (SO) PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR5+ CIO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR5+ ClO4
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR5+ CIO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ ClO4
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		ph tds ci f NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		ph tds ci f no3 no2 so4 po4 alk cn nh3 tkn toc cr6+ cio4
		ph tds ci f No3 No2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CiO4
		ph tds ci f NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		ph tds ci f No3 No2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		ph tds ci f No3 No2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		ph TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		ph tds ci f No3 No2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR5+ ClO4
		ph TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CLE NO, NO, SO, PO, ALK CN: NH, TKN TOC CR6+ ClO,

Comments:	 	

LDC #: 27391A6

VALIDATION FINDINGS WORKSHEET

Blanks

Page: of Reviewer:_ 2nd Reviewer:

METHOD: Inorganics, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y)N N/A Were blank analyses performed as required? If no, please see qualifications below.

YN N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.

(X				
2,4 (50x dil, >5x)				
ciated Samples: 2,4				
Assoc		No Qual's.		
	Blank	Action Limit	24.40	
	Blank ID	ICB/CCB (mg/L)	0.0976	
s: mg/L	Blank ID	PB		
Conc. units: mg/L	Analyte		S04	

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT: All contaminants within five times the method blank concentration were qualified as not detected, "U". LDC#: 27391 A 6

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:_	<u>l_</u> ofl_
Reviewer:	MG
2nd Reviewer:_	

Inorganics, Method See Cover

	Concentration (mg/L)					
Analyte	5	6	RPD (≤25)	Difference	Limits	Qualification (Parent only)
Sulfate	5.9	5.9	0			

V:\FIELD DUPLICATES\FD_inorganic\27391A6.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: February 29, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Explosives

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44539-1

Sample Identification

JP-M13-GWMW126R

JP-M13-GWMW362

JP-M13-GWMW806

JP-M13-GWMW807

JP-M13-GWMW809

JP-M13-GWMW999

JP-M13-GWMW808

JP-M13-GWMW808MS

JP-M13-GWMW808MSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
JP-M13-GWMW808MS/MSD (JP-M13-GWMW808)	HMX 1,3,5-Trinitrobenzene 4-Nitrotoluene	133 (80-115) 142 (65-140) 137 (50-130)	134 (80-115) 137 (50-130)	- - -	J (all detects) J (all detects) J (all detects)	А

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

Samples JP-M13-GWMW809 and JP-M13-GWMW999 were identified as field duplicates. No explosives were detected in any of the samples.

JOAAP-GW

Explosives - Data Qualification Summary - SDG 500-44539-1

SDG	Sample	Compound	Flag	A or P	Reason
500-44539-1	JP-M13-GWMW808	HMX 1,3,5-Trinitrobenzene 4-Nitrotoluene	J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)

JOAAP-GW

Explosives - Laboratory Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

JOAAP-GW

Explosives - Field Blank Data Qualification Summary - SDG 500-44539-1

No Sample Data Qualified in this SDG

Analytical Data

Job Number: 500-44539-1 Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMW126R

Lab Sample ID:

500-44539-1

Client Matrix:

Water

Date Sampled: 02/29/2012 1000

Date Received: 03/01/2012 0947

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: Prep Method:

Dilution:

8330 3535 1.0

Analysis Batch: Prep Batch:

500-142553 500-142545 Instrument ID:

INST39-40 Initial Weight/Volume: 770 mL

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

Analysis Date: Prep Date:	03/07/2012 1746 03/07/2012 0840		•	tion Volume: ılt Type:	100 uL PRIMARY
Analyte		Result (ug/L)	Qualifier	MDL	RL
HMX		<0.31		0.12	0.31
RDX		<0.16		0.077	0.16
1.3.5-Trinitrobenze	ene	<0.16		0.039	0.16
1,3-Dinitrobenzen		<0.16		0.033	0.16
Nitrobenzene		<0.16		0.032	0.16
2,4,6-Trinitrotolue	ne	<0.16		0.036	0.16
Tetryl		<0.39		0.065	0.39
2,4-Dinitrotoluene		<0.31		0.032	0.31
2,6-Dinitrotoluene		<0.31		0.071	0.31
2-Amino-4,6-dinitr		<0.31		0.035	0.31
4-Amino-2,6-dinitr		<0.31		0.074	0.31
2-Nitrotoluene		<0.31		0.082	0.31
4-Nitrotoluene		<0.31		0.082	0.31
3-Nitrotoluene	•	<0.31		0.14	0.31
Surrogate		%Rec	Qualifier	Ассер	tance Limits
1,2-Dinitrobenzen	е	113		70 - 13	30

Client: Toltest Inc.

Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW362

Lab Sample ID:

500-44539-2

Client Matrix:

Water

Date Sampled: 02/29/2012 1120

Date Received: 03/01/2012 0947

8330 Nitroaromatics	and	Nitramines	(HPLC)	

Analysis Method: Prep Method:

8330 3535 Analysis Batch: Prep Batch:

500-142553 500-142545 Instrument ID:

INST39-40 Initial Weight/Volume: 770 mL

Dilution:

1.0

Final Weight/Volume: Injection Volume:

6.0 mL

Analysis Date: Prep Date:

1,2-Dinitrobenzene

03/07/2012 1837 03/07/2012 0840

Result Type:

100 uL PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Vitrobenzene	<0.16		0.032	0.16
4,6-Trinitrotoluene	<0.16		0.036	0.16
etryl	<0.39		0.065	0.39
4-Dinitrotoluene	1.5		0.032	0.31
t,6-Dinitrotoluene	<0.31		0.071	0.31
-Amino-4,6-dinitrotoluene	0.83		0.035	0.31
-Amino-2,6-dinitrotoluene	0.78		0.074	0.31
-Nitrotoluene	<0.31		0.082	0.31
-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Accepta	nce Limits
I.2-Dinitrobenzene	109		70 - 130	

anlida

Analytical Data

Client: Toltest Inc. Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW806

Lab Sample ID:

500-44539-3

Client Matrix:

Water

Date Sampled: 02/29/2012 1300

Date Received: 03/01/2012 0947

		8330 Nitroaromatic	s and Nitramin	es (HPLC	;)	
Analysis Method:	8330	Analysis Batch:	500-142553		Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-142545		Initial Weight/Volume:	770 mL
, Dilution:	1.0	·			Final Weight/Volume:	6.0 mL
Analysis Date:	03/07/2012 1929				Injection Volume:	100 uL
Prep Date:	03/07/2012 0840				Result Type:	PRIMARY
Analyte		Result (u	g/L)	Qualifier	MDL	RL
HMX		<0.31			0.12	0.31
RDX		<0.16			0.077	0.16
1,3,5-Trinitrobenzer	ne	<0.16			0.039	0.16
1,3-Dinitrobenzene		<0.16			0.033	0.16
Nitrobenzene		<0.16			0.032	0.16
2,4,6-Trinitrotoluene	•	<0.16			0.036	0.16
Tetryl		< 0.39			0.065	0.39
2,4-Dinitrotoluene		<0.31			0.032	0.31
2,6-Dinitrotoluene		<0.31			0.071	0.31
2-Amino-4,6-dinitrot	toluene	<0.31			0.035	0.31
4-Amino-2,6-dinitrot	toluene	<0.31			0.074	0.31
2-Nitrotoluene		< 0.31			0.082	0.31
4-Nitrotoluene		<0.31			0.082	0.31
3-Nitrotoluene		<0.31			0.14	0.31
Surrogate		%Rec		Qualifier	Accepta	nce Limits
1,2-Dinitrobenzene		111			70 - 130	

Client: Toltest Inc. Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW807

Lab Sample ID:

500-44539-4

Client Matrix:

Water

Date Sampled: 02/29/2012 1350

Date Received: 03/01/2012 0947

		8330 Nitroaromatic	s and Nitramin	es (HPLC	;)	
Analysis Method:	8330	Analysis Batch:	500-142553		Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-142545		Initial Weight/Volume:	770 mL
Dilution:	1.0	·			Final Weight/Volume:	6.0 mL
Analysis Date:	03/07/2012 2020				Injection Volume:	100 uL
Prep Date:	03/07/2012 0840				Result Type:	PRIMARY
Analyte		Result (u	g/L)	Qualifier	MDL	RL
HMX	<u></u>	<0.31			0.12	0.31
RDX		<0.16			0.077	0.16
1,3,5-Trinitrobenzer	ne	<0.16			0.039	0.16
1,3-Dinitrobenzene		<0.16			0.033	0.16
Nitrobenzene		<0.16			0.032	0.16
2,4,6-Trinitrotoluene)	<0.16			0.036	0.16
Tetryl		< 0.39			0.065	0.39
2,4-Dinitrotoluene		<0.31			0.032	0.31
2,6-Dinitrotoluene		<0.31			0.071	0.31
2-Amino-4,6-dinitrot	oluene	<0.31			0.035	0.31
4-Amino-2,6-dinitrot	oluene	<0.31			0.074	0.31
2-Nitrotoluene		<0.31			0.082	0.31
4-Nitrotoluene		<0.31			0.082	0.31
3-Nitrotoluene		<0.31			0.14	0.31
Surrogate		%Rec		Qualifier	Accepta	nce Limits
1,2-Dinitrobenzene	······································	109			70 - 130	

Orlohi

Client Sample ID:

JP-M13-GWMW809

Lab Sample ID:

500-44539-5

Client Matrix:

Water

Date Sampled: 02/29/2012 1700

Date Received: 03/01/2012 0947

		8330 Nitroaromatics	s and Nitramin	es (HPLC	3)	
Analysis Method:	8330	Analysis Batch:	500-142553		Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-142545		Initial Weight/Volume:	770 mL
Dilution:	1.0				Final Weight/Volume:	6.0 mL
Analysis Date:	03/07/2012 2112				Injection Volume:	100 uL
Prep Date:	03/07/2012 0840				Result Type:	PRIMARY
Analyte		Result (u	g/L)	Qualifier	MDL	RL
HMX	and the same and the same of the same and th	<0.31			0.12	0.31
RDX		<0.16			0.077	0.16
1,3,5-Trinitrobenzer	ne	<0.16			0.039	0.16
1,3-Dinitrobenzene		<0.16			0.033	0.16
Nitrobenzene		<0.16			0.032	0.16
2,4,6-Trinitrotoluene	;	<0.16			0.036	0.16
Tetryl		< 0.39			0.065	0.39
2,4-Dinitrotoluene		<0.31			0.032	0.31
2,6-Dinitrotoluene		<0.31			0.071	0.31
2-Amino-4,6-dinitrof	toluene	<0.31			0.035	0.31
4-Amino-2,6-dinitrol	toluene	<0.31			0.074	0.31
2-Nitrotoluene		< 0.31			0.082	0.31
4-Nitrotoluene		<0.31			0.082	0.31
3-Nitrotoluene		<0.31			0.14	0.31
Surrogate		%Rec		Qualifier	Accepta	nce Limits
1,2-Dinitrobenzene		109			70 - 130	

Analytical Data

Client: Toltest Inc. Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW999

Lab Sample ID:

500-44539-6

Client Matrix:

Water

Date Sampled: 02/29/2012 1200

Date Received: 03/01/2012 0947

Analysis Method: 8330 Analysis Batch: 500-142553 Instrument ID: INST39-40 Prep Method: 3535 Prep Batch: 500-142545 Initial Weight/Volume: 770 mL Dilution: 1.0 Final Weight/Volume: 6.0 mL Analysis Date: 03/07/2012 2203 Free Weight Weight/Volume: 100 uL Prep Date: 03/07/2012 2203 Prep Date: Injection Volume: 100 uL Prep Date: 03/07/2012 2203 Prep Date: Qualifier MDL RE Analyte Result (ug/L) Qualifier MDL RL HMX <0.31 Qualifier MDL RL HMX <0.16 Qualifier MDL RL HMX <0.16 Qualifier		 			-		
Prep Method: 3535 Prep Batch: 500-142545 Initial Weight/Volume: 770 mL Dilution: 1.0 Final Weight/Volume: 6.0 mL Analysis Date: 03/07/2012 0840 Injection Volume: 100 uL Prep Date: 03/07/2012 0840 Result (ug/L) Qualifier MDL RL Analyte Result (ug/L) Qualifier MDL RL HMX <0.31 0.12 0.31 RDX <0.16 0.077 0.16 1,3,5-Trinitrobenzene <0.16 0.039 0.16 1,3-Dinitrobenzene <0.16 0.039 0.16 1,3-Dinitrobenzene <0.16 0.032 0.16 1,3-Frinitrotoluene <0.16 0.032 0.16 1,3-Frinitrotoluene <0.16 0.032 0.16 1,3-Dinitrotoluene <0.16 0.032 0.16 2,4-Grinitrotoluene <0.16 0.032 0.16 2,4-Dinitrotoluene <0.31 0.032 0.31 2,-Dinitrotoluene			8330 Nitroaromatic	s and Nitramin	es (HPLC	;)	
Prep Method: 3535 Prep Batch: 500-142545 Initial Weight/Volume: 770 mL Dilution: 1.0 Final Weight/Volume: 6.0 mL Analysis Date: 03/07/2012 2203 Injection Volume: 100 uL Prep Date: 03/07/2012 0840 Result (ug/L) Qualifier MDL RE Analyte Result (ug/L) Qualifier MDL RL HMX <0.31 0.12 0.31 RDX <0.16 0.077 0.16 1,3,5-Trinitrobenzene <0.16 0.039 0.16 1,3-Dinitrobenzene <0.16 0.033 0.16 1,3-Dinitrobenzene <0.16 0.032 0.16 1,3-Crinitrobenzene <0.016 0.032 0.16 2,4,6-Trinitrobluene <0.016 0.032 0.16 2,4,6-Trinitrobluene <0.31 0.065 0.39 2,4-Dinitrotoluene <0.31 0.032 0.31 2,6-Dinitrotoluene <0.31 0.035 0.31 <th>Analysis Method:</th> <th>8330</th> <th>Analysis Batch:</th> <th>500-142553</th> <th></th> <th>Instrument ID:</th> <th>INST39-40</th>	Analysis Method:	8330	Analysis Batch:	500-142553		Instrument ID:	INST39-40
Analysis Date: 03/07/2012 2203	•	3535	Prep Batch:	500-142545		Initial Weight/Volume:	770 mL
Prep Date: 03/07/2012 0840 Result Type: PRIMARY	•	1.0	•			Final Weight/Volume:	6.0 mL
Prep Date: 03/07/2012 0840 Result (ug/L) Qualifier MDL RL HMX <0.31 0.12 0.31 RDX <0.16 0.077 0.16 1,3,5-Trinitrobenzene <0.16 0.039 0.16 1,3-Dinitrobenzene <0.16 0.033 0.16 Nitrobenzene <0.16 0.032 0.16 Nitrobenzene <0.16 0.032 0.16 2,4,6-Trinitrotoluene <0.16 0.032 0.16 2,4,6-Trinitrotoluene <0.39 0.065 0.39 2,4-Dinitrotoluene <0.31 0.032 0.31 2,6-Dinitrotoluene <0.31 0.071 0.31 2,6-Dinitrotoluene <0.31 0.071 0.31 2,-Amino-4,6-dinitrotoluene <0.31 0.035 0.31 2-Amino-2,6-dinitrotoluene <0.31 0.074 0.31 2-Nitrotoluene <0.31 0.082 0.31 4-Nitrotoluene <0.31 0.082 0.31 3-Nitrotoluene	Analysis Date:	03/07/2012 2203				Injection Volume:	100 uL
HMX	•	03/07/2012 0840				Result Type:	PRIMARY
RDX <0.16 0.077 0.16 1,3,5-Trinitrobenzene <0.16	Analyte		Result (u	g/L)	Qualifie	MDL	RL
1,3,5-Trinitrobenzene <0.16	HMX		<0.31				
1,3-Dinitrobenzene	RDX		<0.16				
Nitrobenzene	1,3,5-Trinitrobenzer	ne	<0.16				
2,4,6-Trinitrotoluene <0.16	1,3-Dinitrobenzene		<0.16				
Comparison	Nitrobenzene		<0.16				
2,4-Dinitrotoluene <0.31	2,4,6-Trinitrotoluene	9	<0.16			0.036	
2,6-Dinitrotoluene	Tetryl		< 0.39			0.065	0.39
2-Amino-4,6-dinitrotoluene <0.31	2,4-Dinitrotoluene		<0.31			0.032	0.31
A-Amino-2,6-dinitrotoluene <0.31 0.074 0.31	2,6-Dinitrotoluene		<0.31			0.071	0.31
2-Nitrotoluene <0.31 0.082 0.31	2-Amino-4,6-dinitro	toluene	<0.31			0.035	0.31
4-Nitrotoluene <0.31	4-Amino-2,6-dinitro	toluene	<0.31			0.074	0.31
3-Nitrotoluene < 0.31 0.14 0.31 Surrogate %Rec Qualifier Acceptance Limits	2-Nitrotoluene		<0.31			0.082	0.31
Surrogate %Rec Qualifier Acceptance Limits	4-Nitrotoluene		<0.31			0.082	0.31
	3-Nitrotoluene	•	<0.31			0.14	0.31
70 400	Surrogate		%Rec		Qualifie	Accepta	nce Limits
1,2-Dinitrobenzene 111 /0 - 130	1,2-Dinitrobenzene	**************************************	111			70 - 130	

Client: Toltest Inc. Job Number: 500-44539-1

Client Sample ID:

JP-M13-GWMW808

Lab Sample ID:

500-44539-7

Client Matrix:

Water

Date Sampled: 02/29/2012 1510

Date Received: 03/01/2012 0947

		8330 Nitroaromatic	s and Nitramin	es (HPLC	;)	
Analysis Method:	8330	Analysis Batch:	500-142553		Instrument ID:	INST39-40
Prep Method:	3535	Prep Batch:	500-142545		Initial Weight/Volume:	770 mL
Dilution:	1.0	•			Final Weight/Volume:	6.0 mL
Analysis Date:	03/07/2012 2255				Injection Volume:	100 uL
Prep Date:	03/07/2012 0840				Result Type:	PRIMARY
Analyte		Result (u	g/L)	Qualifier	MDL	RL
HMX	99-94-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	<0.31		*************************	0.12	0.31
RDX		< 0.16			0.077	0.16
1,3,5-Trinitrobenzer	ie	<0.16			0.039	0.16
1,3-Dinitrobenzene		<0.16			0.033	0.16
Nitrobenzene		<0.16			0.032	0.16
2,4,6-Trinitrotoluene)	<0.16			0.036	0.16
Tetryl		<0.39			0.065	0.39
2,4-Dinitrotoluene		<0.31			0.032	0.31
2,6-Dinitrotoluene		<0.31			0.071	0.31
2-Amino-4,6-dinitrot	oluene	<0.31			0.035	0.31
4-Amino-2,6-dinitrot	oluene	<0.31			0.074	0.31
2-Nitrotoluene		<0.31			0.082	0.31
4-Nitrotoluene		<0.31			0.082	0.31
3-Nitrotoluene		<0.31			0.14	0.31

Surrogate %Rec Qualifier Acceptance Limits 1,2-Dinitrobenzene 101 70 - 130

04/0/12

_DC#	t: 27391A40	VA	LIDATIO	N COMF	PLETENESS	S WORKSHI	EET	Date: <u>4 03</u>
	#: <u>500-44539-1</u>	_			Level III			Page: <u>(</u> of <u>(</u>
_abor	atory: Test America, Inc.	_						Reviewer: A
METH	HOD: HPLC Explosives (E	- ΡΔ	SW 846 Me	thod 8330))			2nd Reviewer: 3VZ
	IOD: TII LO EXPIOSIVOS (L	_1	511 0-10 IIIC		· /			
	amples listed below were		ewed for ea	ch of the f	ollowing valida	ation areas. Val	lidation finding	s are noted in attached
/alida	tion findings worksheets.							
	Validation					C	omments	
I.	Technical holding times	ALGG		A	Sampling dates:	02/20/12		
					1	- 1 1	<u></u>	
	Initial calibration			<u> </u>	1. RSD & 2			
III.	Calibration verification/ICV			A	1. D = 15	<u>ļ.</u>		
IV.	Blanks			A				
	Surrogate recovery			A				
VI.	Matrix spike/Matrix spike dur	olicate	s	W2.	14.11.15			v
VII.	Laboratory control samples			"XX	LCS ONL	4		
VIII.	Target compound identificati	on		N		<u> </u>		
IX.	Compound quantitation/RL/L	.OQ/L	ODs	N				
Х.	System Performance			N			 	
XI.	Overall assessment of data			_A_				
XII.	Field duplicates			ND	FD=5,6	0		
XIII.	Field blanks			<u>N</u>				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rir	io compound sate eld blank	ls detected	D = Duplicate TB = Trip blant EB = Equipme		
√alidat	ed Samples: WATER							
1	JP-M13-GWMW126R [*]	11	14254	5 MB	21		31	
2	JP-M13-GWMW362	12			22		32	
3	JP-M13-GWMW806-	13			23		33	
4	JP-M13-GWMW807	14			24		34	
	A=							

1	JP-M13-GWMW126R [*]	11	142545 MB	21	31
2	JP-M13-GWMW362 [,]	12		22	32
3	JP-M13-GWMW806-	13		23	33
4	JP-M13-GWMW807	14		24	34
5	JP-M13-GWMW809	15		25	35
6	JP-M13-GWMW999	16		26	36
7	JP-M13-GWMW808	17		27	37
88	JP-M13-GWMW808MS	18		28	38
9	JP-M13-GWMW808MSD	19		29	39
10		20		30	40

Notes:			
	 ·		

VALIDATION FINDINGS WORKSHEET

_METHOD: ___GC __HPLC

8310	8330	8151	8141	8141(con't)	8021B
A. Acenaphthene	A. HMX	A 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naied	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	l. 2-Amina-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,ħ)anthracene	J. 2,4-Dinitrotoluene	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Famphur	
N. Naphthalene	N, 4-Nitrotoluene		N. Maiathion	II. Phosmet	
O. Phenanthrene	O. Nitroglycerin		O. Chlorpyrifos	JJ. Tetrachlorvinphos	
P. Pyrene	P. 1, 2 - DINITROBENZENE		P. Fenthion	KK. Demeton (total)	
Ċ	, 0		Q. Parathion-ethyl		
R.			R. Trichlornate		
Š.			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes:_

LDC #. 27391A40

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

Reviewer: 449 2nd Reviewer: JVC

Page: Lof L

METHOD: ___ **GC** __**/HPLC** Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

B Mesilian Mesil	N N N N N N N N N N N N N N N N N N N		Were a matrix spike (MS) and matrix spike duplicate Was an MS/MSD analyzed every 20 samples for each Were the MS/MSD percent recoveries (%R) and related	S) and ma zed every sent recove	itrix spike dupl 20 samples for pries (%R) and	r each ma I relative p	trix or wheneve	Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was p Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?	Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed? Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?	
A R 133 (80-1157) 134 (80-1157) (17) C (442) (45-140) (13+1) (15) (17) C (442) (45-140) (13+1) (15) C (442) (45-140) (13+1) (13+1) C (442) (45-140) (13+1) C (442) (45-140) (13+1) C (442) (45-140) (13+1) C (442) (442) (442) C (442) (442) (442) C	#	MS/MSD ID	Compound	%R	MS (Limits)	M %R (I	SD ⊔imits)	RPD (Limits)	Associated Samples	Qualifications
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13 + (50-130) 13 + (50-130) 15 + (50-130		-	ئ ن	મિજ	(02-140)		())) (
		7	2	137	(20-130)	137	(20-130))	ラ	>
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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

JOAAP-GW

Collection Date:

March 1, 2012

LDC Report Date:

April 5, 2012

Matrix:

Water

Parameters:

Volatiles

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44555-1

Sample Identification

JP-M13-GWMWAEHA 15 JP-M13-GWMWAEHA 14R

Trip Blank

Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r²) were greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
3/14/12	Dichlorodifluoromethane Vinyl acetate cis-1,3-Dichloropropene 4-Methyl-2-pentanone 1,1,1-Trichloroethane 1,1,2-Trichloroethane 2-Hexanone 1,2-Dibromoethane 1,1,2,2-Tetrachloroethane n-Propylbenzene Hexachlorobutadiene 1,2,3-Trichlorobenzene	25.8 20.3 27.3 26.8 32.9 22.5 29.6 24.6 21.9 23.5 30.6 32.5	All samples in SDG 500-44555-1	J (all detects) UJ (all non-detects)	А

The percent difference (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
2/20/12	Dichlorodifluoromethane Chloromethane	27.6 21.7	All samples in SDG 500-44555-1	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	А

All of the continuing calibration relative response factors (RRF) for were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

Sample "Trip Blank" was identified as a trip blank. No volatile contaminants were found.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID	Compound	%R (Limits)	Associated Samples	Flag	A or P
500-143093/4	Vinyl acetate	125 (45-121)	All samples in SD 500-44555-1	J (all detects)	Р

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW Volatiles - Data Qualification Summary - SDG 500-44555-1

SDG	Sample	Compound	Flag	A or P	Reason
500-44555-1	JP-M13-GWMWAEHA 15 JP-M13-GWMWAEHA 14R Trip Blank	Dichlorodifluoromethane Vinyl acetate cis-1,3-Dichloropropene 4-Methyl-2-pentanone 1,1,1-Trichloroethane 1,1,2-Trichloroethane 2-Hexanone 1,2-Dibromoethane 1,1,2,2-Tetrachloroethane n-Propylbenzene Hexachlorobutadiene 1,2,3-Trichlorobenzene	J (all detects) UJ (all non-detects)	А	Continuing calibration (%D)
500-44555-1	JP-M13-GWMWAEHA 15 JP-M13-GWMWAEHA 14R Trip Blank	Dichlorodifluoromethane Chloromethane	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	А	Continuing calibration (ICV %D)
500-44555-1	JP-M13-GWMWAEHA 15 JP-M13-GWMWAEHA 14R Trip Blank	Vinyl acetate	J (all detects)	Р	Laboratory control samples (%R)

JOAAP-GW

Volatiles - Laboratory Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW

Volatiles - Field Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

Client Sample ID: JP-M13-GWMWAEHA 15

Date Sampled: 03/01/2012 0900 Lab Sample ID: 500-44555-1 Date Received: 03/01/2012 1505 Client Matrix: Water

8260B VOC

Analysis Method: 8260B Prep Method: 5030B

1.0

Dilution: Analysis Date:

03/14/2012 0802 Prep Date: 03/14/2012 0802 Analysis Batch: 500-143093 Prep Batch: N/A

Instrument ID: Lab File ID:

CMS18 44555-01.D

Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

Acetone	Analyte	Result (ug/L)	Qualifier	MDL	RL
Stromobenzene	Acetone			1.9	5.0
Some childromethane	Benzene				
Somoich formethane	Bromobenzene				
Bromoform 1.0 0.45 1.0	Bromochioromethane	<1.0		0.50	
Solution	Bromodichloromethane	<1.0		0.23	1.0
Section Sec	Bromoform	<1.0		0.45	1.0
2-Butanone (MEK)	Bromomethane	<1.4			1.4
n-Butylbenzene		<5.0			5.0
sec-Butylbenzene	, ,	<1.0		0.21	1.0
tert-Butylbenzene		<1.0		0.19	1.0
Carbon disulfide <5.0		<1.0		0.24	1.0
Carbon tetrachloride <1.0	· · · · · · · · · · · · · · · · · · ·	<5.0		0.44	5.0
Chlorobenzene				0.28	1.0
Dibromochloromethane					
Chloroethane				0.25	
Chloroform				0.33	1.4
Chloromethane	•			0.25	1.0
2-Chlorotoluene					
Vinyl acetate 42.0 ♥ 3.0 4-Chlorotoluene 41.0 1,2-Dibromo-3-Chloropropane 42.6 1,2-Dibromoethane 41.0 ♥ 5 Dibromomethane 41.0 ♥ 5 1,2-Dichlorobenzene 41.0 1,3-Dichlorobenzene 41.0 1,3-Dichlorobenzene 41.0 1,4-Dichlorobenzene 41.0 1,4-Dichlorobenzene 41.0 1,4-Dichloroethane 41.0 1,1-Dichloroethane 41.0 1,2-Dichloroethane 41.0 1,1-Dichloroethane 41.0 1,1-Dichloroethene 41.0 2,2-Dichloroethene 41.0 4,1.0 0.28 1,1-Dichloroethene 41.0 4,0 0.29 1,1-Dichloropropane 41.0 4,2-Dichloropropane 41.0 4,2-Dichloropropane 41.0 4,0 0.27 1,0 0.27 1,0 0.27 1,0 0.25 1,0 0.25 1,0 0.25 <td></td> <td></td> <td></td> <td></td> <td>1.0</td>					1.0
A-Chlorotoluene			*		
1,2-Dibromo-3-Chloropropane	•				1.0
1,2-Dibromoethane					
1.0 0.39 1.0	•				
1,2-Dichlorobenzene	·				
1,3-Dichlorobenzene					
1,4-Dichlorobenzene	•				
Dichlorodifluoromethane 1,1-Dichloroethane 1,1-Dichloroethane 1,2-Dichloroethane 1,1-Dichloroethane 1,1-Dichloroethane 1,1-Dichloroethane 1,1-Dichloroethene 1,1-Dichloroethene 1,1-Dichloroethene 1,1-Dichloroethene 1,1-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene 1,2-Dichloroethene 1,2-Dichloropropane 1,2-Dichloropropane 1,2-Dichloropropane 1,3-Dichloropropane 1,0 1,3-Dichloropropane 1,0 1,1-Dichloropropane 1,0 1,1-Dichloropropene 1,0 1,1-Dichloropropene 1,0 1,1-Dichloropropene 1,0 1,1-Dichloropropene 1,0 1,1-Dichloropropene 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0 1,0	·				
1,1-Dichloroethane <1.0	•				
1,2-Dichloroethane <1,0					
1,1-Dichloroethene					
cis-1,2-Dichloroethene <1.0	·				
trans-1,2-Dichloroethene	•				
1,2-Dichloropropane <1.0	•				
1,3-Dichloropropane <1.0	•				
2,2-Dichloropropane <1.0					
1,1-Dichloropropene <1.0					
7,1-Dichloropropeded <1.0 US					
trans-1,3-Dichloropropene <1.0 0.35 1.0 Ethylbenzene <1.0 0.14 1.0 2-Hexanone <5.0 ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥ ♥					
Ethylbenzene <1.0					
2-Hexanone					
Hexachlorobutadiene <1.0 US	•				
Isopropylbenzene <1.0		~10 UZ			
p-Isopropyltoluene <1.0 0.24 1.0 Methylene Chloride <3.0 0.63 3.0					
Methylene Chloride <3.0 0.63 3.0					
Wichity Chic Official Control					
4-Metnyi-z-pentanone (MIBK)	•				
	4-ivietnyi-z-pentanone (IVIBK)	\0.U \V \		0.15	0.0

03/22/2012 Page 17 of 799 024/6/12 TestAmerica Chicago

JP-M13-GWMWAEHA 15 Client Sample ID:

Lab Sample ID:

500-44555-1

Client Matrix:

Water

Date Sampled: 03/01/2012 0900 Date Received: 03/01/2012 1505

8260B VOC

Analysis Method: 8260B

5030B

Analysis Batch:

500-143093

instrument ID:

CMS18

Prep Method:

Prep Batch:

N/A

Lab File ID:

44555-01.D

Dilution:

1.0

Initial Weight/Volume: 5 mL

Analysis Date: Prep Date:

03/14/2012 0802

03/14/2012 0802

Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL	
Methyl tert-butyl ether	<1.0		0.28	1.0	
Naphthalene	<1.0		0.24	1.0	
N-Propylbenzene	<1.0 US		0.19	1.0	
Styrene	<1.0		0.26	1.0	
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0	
1,1,2,2-Tetrachloroethane	<1.0 US		0.35	1.0	
Tetrachloroethene	<1.0		0.22	1.0	
Toluene	<1.0		0.15	1.0	
1,2,3-Trichlorobenzene	<1.0 UT		0.36	1.0	
1,2,4-Trichlorobenzene	<1.0		0.22	1.0	
1,1,1-Trichloroethane	<1.0 V ^T		0.26	1.0	
1,1,2-Trichloroethane	<1.0 <i>U</i> ⊃		0.30	1.0	
Trichloroethene	<1.0		0.18	1.0	
Trichlorofluoromethane	<1.0		0.22	1.0	
1,2,3-Trichloropropane	<1.2		0.60	1.2	
1,2,4-Trimethylbenzene	<1.0		0.22	1.0	
1,3,5-Trimethylbenzene	<1.0		0.23	1.0	
Vinyl chloride	<1.0		0.13	1.0	
o-Xylene	<1.0		0.13	1.0	
m&p-Xylene	<2.0		0.30	2.0	
Xylenes, Total	<1.0		0.30	1.0	

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	94		75 - 120
Dibromofluoromethane	102		85 - 115
1,2-Dichloroethane-d4 (Surr)	85		70 - 120
Toluene-d8 (Surr)	97		85 - 120

Client Sample ID:

JP-M13-GWMWAEHA 14R

Lab Sample ID:

500-44555-2

Client Matrix:

Water

Date Sampled: 03/01/2012 1200

Date Received: 03/01/2012 1505

8260B VOC

Analysis Method: 8260B

5030B

Analysis Batch:

500-143093

Instrument ID:

CMS18

Prep Method:

Prep Batch:

N/A

Lab File ID:

44555-02.D

Dilution:

1.0

Initial Weight/Volume: 5 mL Final Weight/Volume:

5 mL

Analysis Date: Prep Date:

03/14/2012 0827

03/14/2012 0827

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5,0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
•	<1.0		0.19	1.0
sec-Butylbenzene	<1.0		0.24	1.0
tert-Butylbenzene	<5.0		0.44	5.0
Carbon disulfide	<1.0		0.28	1.0
Carbon tetrachloride	<1.0		0.24	1.0
Chlorobenzene	<1.0		0.25	1.0
Dibromochloromethane			0.33	1.4
Chloroethane	<1.4		0.35	1.0
Chloroform	<1.0		0.23	1.0
Chloromethane	<1.0 VJ		0.24	1.0
2-Chlorotoluene	<1.0	*		2.0
Vinyl acetate	<2.0 US	·	0.48	1.0
4-Chlorotoluene	<1.0		0.21	
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0 US		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0 05		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0 ひづ		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0 ഗ		0.56	5.0
Hexachlorobutadiene	<1.0 05		0.45	1.0
Isopropylbenzene	<1.0		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0 රා		0.79	5.0
- mony - pomonono (masty				

Client Sample ID: JP-M13-GWMWAEHA 14R

Lab Sample ID: 500-44555-2

Water Client Matrix:

Date Sampled: 03/01/2012 1200 Date Received: 03/01/2012 1505

8260B VOC

Analysis Method: 8260B 5030B Prep Method: Dilution:

1.0

Analysis Date: Prep Date:

03/14/2012 0827 03/14/2012 0827

Analysis Batch: 500-143093 Prep Batch: N/A

Instrument ID: Lab File ID:

CMS18 44555-02.D

Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

1 100 2010.				
Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0 VS		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0 ひご		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0 US		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0 US_		0.26	1.0
1,1,2-Trichloroethane	<1.0 U S		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0
•				
Surrogate	%Rec	Qualifier		ance Limits
4-Bromofluorobenzene (Surr)	101		75 - 12	
Dibromofluoromethane	112		85 - 11	
1,2-Dichloroethane-d4 (Surr)	96		70 - 12	
Toluene-d8 (Surr)	98		85 - 12	0

Client Sample ID:

Trip Blank

Lab Sample ID:

500-44555-3TB

Client Matrix:

Water

Date Sampled: 03/01/2012 0000 Date Received: 03/01/2012 1505

8260B VOC

Analysis Method: 8260B

Analysis Batch: 500-143093

Instrument ID:

CMS18

Prep Method:

5030B

Prep Batch:

Result (ug/L)

Lab File ID:

Dilution:

1.0

Qualifier

44555-03.D

RL

Analysis Date:

N/A

Initial Weight/Volume: 5 mL

MDL

03/14/2012 0852 03/14/2012 0852 Final Weight/Volume:

Prep Date:
Analyte
Acetone
Benzene
Bromobenz
Bromochio
Bromodich
Bromoform
Bromometh
2-Butanone
n-Butylben:
sec-Butylbe
tert-Butylbe
Carbon dis
Carbon tetr
Chlorobenz
Dibromoch

Analyte	Result (ug/L)	Qualifier	IVIDL	ΓL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0 <i>い</i> ろ		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0 UT	*	0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0 √S		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0 VS		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0 ک ^ح		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0 いろ		0.56	5.0
Hexachlorobutadiene	<1.0 VS		0.45	1.0
Isopropylbenzene	<1.0		0.21	1,0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0 vS		0.79	5.0
TestAmerica Chicago	Page 21 of 799	•	024/6/12	03/22

03/22/2012

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID:

Trip Blank

Lab Sample ID:

500-44555-3TB

Client Matrix:

Water

Date Sampled: 03/01/2012 0000

Date Received: 03/01/2012 1505

8260B VOC

Analysis Method: 8260B

5030B

Analysis Batch: 500-143093

Instrument ID:

CMS18

Prep Method:

Prep Batch:

Lab File ID:

44555-03.D

Dilution:

N/A

1.0

03/14/2012 0852

Initial Weight/Volume: 5 mL

Analysis Date:

Final Weight/Volume: 5 mL

•	
Prep	Date:

03/14/2012 0852

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0 <i>U</i> 3		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0 <i>ひ</i> ろ		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0 US		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0 VS		0.26	1.0
1,1,2-Trichloroethane	<1.0 VS		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0
Surrogate	%Rec	Qualifier	ance Limits	
4-Bromofluorobenzene (Surr)	95		75 - 12	0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	95		75 - 120
Dibromofluoromethane	108		85 - 115
1,2-Dichloroethane-d4 (Surr)	88		70 - 120
Toluene-d8 (Surr)	103		85 - 120

_DC #: <u>27391B1</u>	VALIDATION COMPLETENESS WORKSHEET	Date:
SDG #: <u>500-44555-1</u>	_ Level III	Page:_
_aboratory: <u>Test America, Inc.</u>		Reviewer:
		2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
l.	Technical holding times	A	Sampling dates: 03 61 12
11.	GC/MS Instrument performance check	A	
111.	Initial calibration	A	RSD = 30 152 r2
IV.	Continuing calibration/ICV	sW	RSD = 30 152 r2
V.	Blanks	A	
VI.	Surrogate spikes	Ą	
VII.	Matrix spike/Matrix spike duplicates	N	Olient spec.
VIII.	Laboratory control samples	SW	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	·
XIV.	System performance	N	
XV.	Overall assessment of data	Ą	
XVI.	Field duplicates	Ν	
XVII.	Field blanks	ND	TB= 1

Note:

A = Acceptable N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate TB = Trip blank EB = Equipment blank

Water Validated Samples:

1	JP-M13-GWMWAEHA 15	11	500_143093-MB	21	31	
2	JP-M13-GWMWAEHA 14R	12		22	32	
3	Trip Blank	13		23	33	
4		14		24	34	
5		15		25	35	
6		16		26	 36	
7		17		27	37	
8		18		28	 38	
9		19		29	39	
10		20_		30	40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	J.J. 1,2-Dichlorobenzene	DDDD. Isopropyt alcohol
C. Vinyl choride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLE. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disutfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlarobenzene	IIII. Isobutyl akohol
H. 1,1-Dichloroethene**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1.2-Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m.p-Xylenes	LLLL. Ethyl ether
K. Chloroform**	EE. Ethylbenzene**	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN.
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	.0000
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	рррр.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	www. Ethanol	סססם.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL, Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	тт.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-tsopropyltoluene	AAAA. Ethyl tert-butyl ether	ນບບນ.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1.4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	ww.

^{* =} System performance check compounds (SPCC) for RRF; ** = Calibration check compounds (CCC) for %RSD.

LDC#: 273/15)

VALIDATION FINDINGS WORKSHEET Continuing Calibration

Page: (of 2nd Reviewer: Reviewer:_

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". N N/A

Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF?

Qualifications	J/45/A		J W7/A																		
Associated Samples	A-(1		Ŋ - ()																		
Finding RRF (Limit: >0.05)															,	!					
Finding %D (Limit: <25,8%)	27.6	21.7	25.8	20.3	27.3	26.8	32.9	22.5	29.6	24.6	21.9	23.5	30.6								
Compound	53	А	55	HH	R	γ	М	K	5	TT	88	7.7	777	NNN							
Standard ID	1CV-CMS18		18C0313n																	•	
Date	02/2/2/12	-	03/14/12																		
#																					

SDG #: SCC CON LDC #: 27391B1

VALIDATION FINDINGS WORKSHEET Laboratory Control Samples (LCS)

Page:

Reviewer: _ 2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Was a LCS required? Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

	T	T	T		Ī		Ī	Γ											_					
Qualifications	14.418																							
Associated Samples	A-11																							
	^	_	-	~	^	<u> </u>	_	^	(^	î	(((^	()	((^	_	^	^	
RPD (Limits))	_)))))))))))))))	·	_	_	_)	•
	<u> </u>	^	_	_	^	(_	^	^)) ())	()	^	((^	_	_	^	^	$\overline{}$
LCSD %R (Limits)))	_).)	٠)	`	<u> </u>)))))))))	J	J	_	•)	•
LCS %R (Limits)	125(45-121)	()	~	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	(()	(()	()
Compound	114																							
rcs/rcsd id	500 - 143093/4	•																						
Date																								
*																								

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: March 1, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Semivolatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44555-1

Sample Identification

JP-M13-GWMWAEHA 15 JP-M13-GWMWAEHA 14R JP-M13-GWMWAEHA 14RRE

Introduction

This data review covers 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
JP-M13-GWMWAEHA 14RRE	All TCL compounds	18	7	J (all detects) UJ (all non-detects)	А

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs) with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
3/15/12	3&4-Methylphenol Benzoic acid Fluorene Butylbenzylphthalate Bis(2-ethylhexyl)phthalate Benzo(k)fluoranthene	17.0 25.0 16.0 18.0 20.0 19.0	All samples in SDG 500-44555-1	J (all detects) UJ (all non-detects)	А

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
3/20/12	Bis(2-chloroethyl) ether	25.5	JP-M13-GWMWAEHA 14RRE 500-143645-MB	J (all detects) UJ (all non-detects)	А

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
3/15/12	4-Chlorophenyl-phenyl ether 2,4-Dimethylphenol 2-Methylnaphthalene 2,4,6-Trichlorophenol 2-Chloronaphthalene Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol 4-Nitrophenol Fluorene N-Nitrosodiphenylamine 4-Bromophenyl-phenyl ether Hexachlorobenzene Phenanthrene Anthracene Carbazole Benzo(a)anthracene	20.2 21.5 23.4 22.2 20.6 20.5 25.8 20.5 22.1 23.8 21.3 24.0 21.9 21.7 20.5 21.8	All samples in SDG 500-44555-1	J (all detects) UJ (all non-detects)	A

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
JP-M13-GWMWAEHA 14R	2-Fluorophenol Phenol-d5 Nitrobenzene-d5 2-Fluorobiphenyl	3 (20-110) 7 (10-115) 5 (40-110) 38 (50-110)	All TCL compounds	J (all detects) R (all non-detects)	A

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
500-143645/2-A (JP-M13-GWMWAEHA 14R 500-143645-MB)	Benzidine Benzoic acid 2-Nitroaniline 4-Nitrophenol			27 (≤20) 116 (≤20) 25 (≤20) 27 (≤20)	J (all detects) UJ (all non-detects)	Р

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
JP-M13-GWMWAEHA 14R	Chrysene-d12 Perylene-d12	276691 (284090-1136358) 218084 (342810-685619)	Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene Bis(2-ethylhexyl)phthalate Benzidine Di-n-octylphthalate Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW Semivolatiles - Data Qualification Summary - SDG 500-44555-1

050					
SDG	Sample	Compound	Flag	A or P	Reason
500-44555-1	JP-M13-GWMWAEHA 14RRE	All TCL compounds	J (all detects) UJ (all non-detects)	А	Technical holding time
500-44555-1	JP-M13-GWMWAEHA 15 JP-M13-GWMWAEHA 14R JP-M13-GWMWAEHA 14RRE	3&4-Methylphenol Benzoic acid Fluorene Butylbenzylphthalate Bis(2-ethylhexyl)phthalate Benzo(k)fluoranthene	J (all detects) UJ (all non-detects)	А	Initial calibration (%RSD)
500-44555-1	JP-M13-GWMWAEHA 14RRE	Bis(2-chloroethyl) ether	J (all detects) UJ (all non-detects)	А	Continuing calibration (%D)
500-44555-1	JP-M13-GWMWAEHA 15 JP-M13-GWMWAEHA 14R JP-M13-GWMWAEHA 14RRE	4-Chlorophenyl-phenyl ether 2,4-Dimethylphenol 2-Methylnaphthalene 2,4,6-Trichlorophenol 2-Chloronaphthalene Acenaphthene 2,4-Dinitrophenol 4-Nitrophenol 4-Nitrophenol Fluorene N-Nitrosodiphenylamine 4-Bromophenyl-phenyl ether Hexachlorobenzene Phenanthrene Anthracene Carbazole Benzo(a)anthracene	J (all detects) UJ (all non-detects)	А	Continuing calibration (ICV %D)
500-44555-1	JP-M13-GWMWAEHA 14R	All TCL compounds	J (all detects) R (all non-detects)	Α	Surrogate spikes (%R)
500-44555-1	JP-M13-GWMWAEHA 14R	Benzidine Benzoic acid 2-Nitroaniline 4-Nitrophenol	J (all detects) UJ (all non-detects)	Р	Laboratory control samples (RPD)
500-44555-1	JP-M13-GWMWAEHA 14R	Pyrene Butylbenzylphthalate 3,3'-Dichlorobenzidine Benzo(a)anthracene Chrysene Bis(2-ethylhexyl)phthalate Benzidine Di-n-octylphthalate Benzo(b)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenzo(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	А	Internal standards (area)

JOAAP-GW

Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW

Semivolatiles - Field Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID:

JP-M13-GWMWAEHA 15

Lab Sample ID:

500-44555-1

Client Matrix:

Water

Date Sampled: 03/01/2012 0900 Date Received: 03/01/2012 1505

8270C SVOC

Result (ug/L)

Analysis Method: 8270C

Analysis Batch: 500-143421

Instrument ID:

Qualifier

CMS23

Prep Method: Dilution:

3510C

Prep Batch:

500-142158

Lab File ID: Initial Weight/Volume: 950 mL

44555-1.d

1.0

Final Weight/Volume:

MDL

1.0 mL

RL

Analysis Date:

Analyte

03/16/2012 2042

Injection Volume:

1 uL

Prep Date: 03/02/2012 0915

Allalyte			~ ~~~	
Acenaphthene	<1.1 US	0.38	1.1	
N-Nitrosodimethylamine	<11 いろ	1.4	11	
Acenaphthylene	<1.1	0.34	1.1	
Anthracene	<1.1 UJ	0.34	1.1	
Benzidine	<42	21	42	
Benzoic acid	<21 05	4.8	21	
Benzo[a]anthracene	<0.21 ^U 3	0.046	0.21	
Benzo[b]fluoranthene	<0.21	0.061	0.21	
Benzo[k]fluoranthene	<0.26 ひて	0.078	0.26	
Benzo[g,h,i]perylene	<1.1	0.44	1.1	
Benzo[a]pyrene	<0.21	0.059	0.21	
Benzyl alcohol	<21	3.2	21	
Bis(2-chloroethoxy)methane	<2.1	0.32	2.1	
Bis(2-chloroethyl)ether	<2.1	0.37	2.1	
2,2'-oxybis[1-chloropropane]	<2.1	0.32	2.1	
Bis(2-ethylhexyl) phthalate	<11 05	2.6	11	
4-Bromophenyl phenyl ether	<5.3 UT	0.96	5.3	
Butyl benzyl phthalate	<2.1 05	0.28	2.1	
	<5.3 US	1.0	5.3	
Carbazole 4-Chloroaniline	<11	2.2	11	
	<11	2.3	11	
4-Chioro-3-methylphenol	<2.1 03	0.36	2.1	
2-Chioronaphthalene	<5.3	0.84	5.3	
2-Chlorophenol	<5.3 U∕S	0.85	5.3	
4-Chlorophenyl phenyl ether		0.15	0.53	
Chrysene	<0.53	0.067	0.32	
Dibenz(a,h)anthracene	<0.32	0.37	2.1	
Dibenzofuran	<2.1	0.84	5.3	
Di-n-butyl phthalate	<5.3	0.31	2.1	
1,2-Dichlorobenzene	<2.1	0.26	2.1	
1,3-Dichlorobenzene	<2.1		2.1	
1,4-Dichlorobenzene	<2.1	0.28		
3,3'-Dichlorobenzidine	<5.3	0.99	5.3	
2,4-Dichlorophenol	<11	2.4	11	
Diethyl phthalate	<2.1	0.46	2.1	
2,4-Dimethylphenol	<11 US	3.5	11	
Dimethyl phthalate	<2.1	0.40	2.1	
4,6-Dinitro-2-methylphenol	<21	5.2	21	
2,4-Dinitrophenol	<21 05 ^	7.8	21	
2,4-Dinitrotoluene	<1.5	0.32	1.5	
2,6-Dinitrotoluene	<0.53	0.13	0.53	
Di-n-octyl phthalate	<11	2.6	11	
Fluoranthene	<1.1	0.34	1.1	
Fluorene	<1.1 US	0.40	1.1	
1,2-Diphenylhydrazine	<5.3	0.74	5.3	
Hexachlorobenzene	<0.53 びる	0.15	0.53	
Hexachlorobutadiene	<5.3	1.2	5.3	
1 IOARONIO ODDITUONO	***			

TestAmerica Chicago

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1.2 Rul6/12

03/22/2012

Job Number: 500-44555-1 Client: Toltest Inc.

Client Sample ID: JP-M13-GWMWAEHA 15

Lab Sample ID:

500-44555-1

Client Matrix:

Water

Date Sampled: 03/01/2012 0900

Date Received: 03/01/2012 1505

8270C SVOC

Analysis Method: 8270C Prep Method:

3510C

Analysis Batch: 500-143421

Instrument ID: Lab File ID:

CMS23 44555-1.d

Dilution:

1.0

500-142158 Prep Batch:

Final Weight/Volume: 1.0 mL

Initial Weight/Volume: 950 mL

Analysis Date: Prep Date:

03/16/2012 2042 03/02/2012 0915

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<5.3		1.0	5.3
Indeno[1,2,3-cd]pyrene	<0.26		0.088	0.26
Isophorone	<2.1		0.31	2.1
2-Methylnaphthalene	<0.53 US		0.14	0.53
2-Methylphenol	<2.1 US @416 M		0.33	2.1
3 & 4 Methylphenol	<2.1 UJ		0.46	2.1
Naphthalene	<1.1		0.32	1.1
2-Nitroaniline	<5.3		1.1	5.3
3-Nitroaniline	<11		2.4	11
4-Nitroaniline	<11		4.1	11
Nitrobenzene	<1.1		0.47	1.1
2-Nitrophenol			2.3	11
4-Nitrophenol	<21 US		2.5	21
N-Nitrosodiphenylamine	<1.1		0.36	1.1
N-Nitrosodi-n-propylamine	<0.53		0.15	0.53
Pentachlorophenol	<11		5.9	11
Phenanthrene	<1.1 US		0.37	1.1
Phenoi	<5.3		0.38	5.3
	<1.1		0.51	1.1
Pyrene 1,2,4-Trichlorobenzene	<2.1		0.32	2.1
* '	<11		2.4	11
2,4,5-Trichlorophenol 2,4,6-Trichlorophenol	<5.3 ∪∑	•	1.2	5.3
Surrogate	%Rec	Qualifier	Accepta	ance Limits
O Flueranhanal	41	······································	20 - 110)

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	41		20 - 110
Phenol-d5	28		10 - 115
Nitrobenzene-d5	73		40 - 110
2-Fluorobiphenyl	79		50 - 110
2,4,6-Tribromophenol	74		40 - 125
Terphenyl-d14	85		50 - 135
1 CIDITELIAI-0 14	00		•

Job Number: 500-44555-1 Client: Toltest inc.

Client Sample ID:

JP-M13-GWMWAEHA 14R

Lab Sample ID:

500-44555-2

Client Matrix:

Water

Date Sampled: 03/01/2012 1200 Date Received: 03/01/2012 1505

8270C SVOC

Analysis Method: 8270C

Analysis Batch: 500-143421

instrument ID:

CMS23

Prep Method:

3510C

Prep Batch:

500-142158

Lab File ID:

44555-2.d

Dilution:

1.0

Initial Weight/Volume: 1050 mL

Analysis Date: Prep Date:

03/16/2012 2102 03/02/2012 0915 Final Weight/Volume: 1.0 mL Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.95 🤼		0.34	0.95
N-Nitrosodimethylamine	<9.5 \		1.3	9.5
Acenaphthylene	<0.95		0.30	0.95
Anthracene	<0.95		0.30	0.95
Benzidine	<38		19	38
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.042	0.19
Benzo[b]fluoranthene	<0.19		0.055	0.19
Benzo[k]fluoranthene	<0.24		0.070	0.24
Benzo[g,h,i]perylene	<0.95		0.40	0.95
Benzo[a]pyrene	<0.19		0.053	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.29	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.29	1.9
Bis(2-ethylhexyl) phthalate	<9.5		2.3	9.5
4-Bromophenyl phenyl ether	<4.8		0.87	4.8
	<1.9		0.26	1.9
Butyl benzyl phthalate	<4.8		0.94	4.8
Carbazole	<9.5		2.0	9.5
4-Chloroaniline	<9.5		2.1	9.5
4-Chloro-3-methylphenol	<1.9		0.32	1.9
2-Chloronaphthalene	<4.8		0.76	4.8
2-Chiorophenol	<4.8		0.77	4.8
4-Chlorophenyl phenyl ether			0.13	0.48
Chrysene	<0.48		0.061	0.29
Dibenz(a,h)anthracene	<0.29		0.33	1.9
Dibenzofuran	<1.9		0.76	4.8
Di-n-butyl phthalate	<4.8			1.9
1,2-Dichlorobenzene	<1.9		0.28	1.9
1,3-Dichlorobenzene	<1.9		0.24	
1,4-Dichlorobenzene	<1.9		0.26	1.9
3,3'-Dichlorobenzidine	<4.8		0.90	4.8
2,4-Dichlorophenol	<9.5		2.2	9.5
Diethyl phthalate	<1.9		0.42	1.9
2,4-Dimethylphenol	<9.5		3.2	9.5
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.7	19
2,4-Dinitrophenol	<19 \	۸	7.1	19
2,4-Dinitrotoluene	<1.3		0.29	1.3
2,6-Dinitrotoluene	<0.48		0.11	0.48
Di-n-octyl phthalate	<9.5		2.4	9.5
Fluoranthene	<0.95		0.30	0.95
Fluorene	<0.95		0.36	0.95
1,2-Diphenylhydrazine	<4.8		0.67	4.8
Hexachlorobenzene	<0.48		0.13	0.48
Hexachlorobutadiene	<4.8		1.1	4.8
TestAmerica Chicago	Page 25 of 75	99	24/6/12	03/22/201

03/22/2012

Job Number: 500-44555-1 Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMWAEHA 14R

Lab Sample ID:

500-44555-2

Client Matrix:

Water

Date Sampled: 03/01/2012 1200 Date Received: 03/01/2012 1505

8270C SVOC

Analysis Method: 8270C

3510C

Analysis Batch: 500-143421

Instrument ID:

CMS23 44555-2.d

Prep Method: Dilution:

1.0

Prep Batch: 500-142158 Lab File ID: Initial Weight/Volume: 1050 mL Final Weight/Volume: 1.0 mL

Analysis Date: Prep Date:

03/16/2012 2102 03/02/2012 0915

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.8 (3		0.92	4.8
Indeno[1,2,3-cd]pyrene	<0.24		0.080	0.24
Isophorone	<1.9		0.28	1.9
2-Methylnaphthalene	<0.48		0.12	0.48
2-Methylphenol	<1.9		0.30	1.9
3 & 4 Methylphenol	<1.9 ↓		0.42	1.9
Naphthalene	0.32 了	J	0.29	0.95
2-Nitroaniline	<4.8 3		1.0	4.8
	<9.5		2.2	9.5
3-Nitroaniline	<9.5		3.7	9.5
4-Nitroaniline	<0.95		0.43	0.95
Nitrobenzene	<9.5		2.0	9.5
2-Nitrophenol	<9.5 <19		2.2	19
4-Nitrophenol			0.32	0.95
N-Nitrosodiphenylamine	<0.95		0.13	0.48
N-Nitrosodi-n-propylamine	<0.48		5.3	9.5
Pentachlorophenol	<9.5		0.33	0.95
Phenanthrene	<0.95			4.8
Phenol	<4.8		0.34	
Pyrene	<0.95		0.46	0.95
1,2,4-Trichlorobenzene	<1.9		0.29	1.9
2,4,5-Trichlorophenol	<9.5		2.2	9.5
2,4,6-Trichlorophenol	<4.8 🗸		1.0	4.8

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	3	X	20 - 110
Phenol-d5	7	X	10 - 115
Nitrobenzene-d5	5	X	40 - 110
2-Fluorobiphenyl	38	Х	50 - 110
2,4,6-Tribromophenol	83		40 - 125
Terphenyl-d14	111		50 - 135

Job Number: 500-44555-1 Client: Toltest Inc.

JP-M13-GWMWAEHA 14R Client Sample ID:

Lab Sample ID: Client Matrix:

Water

500-44555-2

Date Sampled: 03/01/2012 1200 Date Received: 03/01/2012 1505

8270C SVOC

Analysis Method: 8270C

Analysis Batch:

500-143761

Instrument ID: Lab File ID:

CMS23

Prep Method:

3510C

Prep Batch:

500-143645

Initial Weight/Volume: 1070 mL

44555-2RE.d

Dilution: Analysis Date:

1.0 03/20/2012 1739

Run Type:

RΕ

Final Weight/Volume: 1.0 mL Injection Volume:

1 uL

03/19/2012 1330 Prep Date:

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93 U T	Н	0.34	0.93
N-Nitrosodimethylamine	<9.3	Н	1.3	9.3
Acenaphthylene	<0.93	Н	0.30	0.93
Anthracene	<0.93	Н	0.30	0.93
Benzidine	<37	H *	19	37
Benzoic acid	<19	H *	4.3	19
Benzo[a]anthracene	<0.19	Н	0.041	0.19
Benzo[b]fluoranthene	<0.19	Н	0.054	0.19
Benzo[k]fluoranthene	<0.23	Н	0.069	0.23
Benzo[g,h,i]perylene	<0.93	Н	0.39	0.93
Benzo[a]pyrene	<0.19	Н	0.052	0.19
	<19	Н	2.9	19
Benzyl alcohol Bis(2-chloroethoxy)methane	<1.9	H	0.28	1.9
	<1.9	H	0.33	1.9
Bis(2-chloroethyl)ether	<1.9	H	0.28	1.9
2,2'-oxybis[1-chloropropane]	<9.3	H	2.3	9.3
Bis(2-ethylhexyl) phthalate	<4.7	H	0.85	4.7
4-Bromophenyl phenyl ether	<1.9	H	0.25	1.9
Butyl benzyl phthalate	<4.7	H	0.93	4.7
Carbazole	<9.3	Н	2.0	9.3
4-Chloroaniline	<9.3 <9.3	H	2.1	9.3
4-Chloro-3-methylphenol		H	0.32	1.9
2-Chloronaphthalene	<1.9	H	0.75	4.7
2-Chlorophenol	<4.7	H	0.76	4.7
4-Chlorophenyl phenyl ether	<4.7	л Н	0.73	0.47
Chrysene	<0.47		0.060	0.28
Dibenz(a,h)anthracene	<0.28	H	0.33	1.9
Dibenzofuran	<1.9	Н	0.35	4.7
Di-n-butyl phthalate	<4.7	H	0.75	1.9
1,2-Dichlorobenzene	<1.9	H		1.9
1,3-Dichlorobenzene	<1.9	H	0.23	1.9
1,4-Dichlorobenzene	<1,9	н	0.25	4.7
3,3'-Dichlorobenzidine	<4.7	H	0.88	9.3
2,4-Dichlorophenol	<9.3	H	2.1	9.3 1.9
Diethyl phthalate	<1.9	H	0.41	9.3
2,4-Dimethylphenol	<9.3	H	3.1	9.3 1.9
Dimethyl phthalate	<1.9	H	0.36	
4,6-Dinitro-2-methylphenol	<19	Н	4.6	19
2,4-Dinitrophenol	<19 \	H ^	6.9	19
2,4-Dinitrotoluene	<1.3 \	H	0.28	1.3
2,6-Dinitrotoluene	<0.47	H	0.11	0.47
Di-n-octyl phthalate	<9.3	Н	2.3	9.3
Fluoranthene	<0.93	Н	0.30	0.93
Fluorene	<0.93	Н	0.36	0.93
1,2-Diphenylhydrazine	<4.7	Н	0.65	4.7
Hexachlorobenzene	<0.47	Н	0.13	0.47
Hexachlorobutadiene	<4.7	Н	1.0	4.7

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024/6/12 03/22/2012 Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID:

JP-M13-GWMWAEHA 14R

Lab Sample ID:

500-44555-2

Client Matrix:

Water

Date Sampled: 03/01/2012 1200 Date Received: 03/01/2012 1505

827	nc:	S١	/OC	:

Analysis Method: 8270C

Analysis Batch:

500-143761

Instrument ID:

CMS23

Prep Method:

3510C

Prep Batch:

500-143645

Lab File ID:

44555-2RE.d

Dilution:

1.0

Run Type:

Initial Weight/Volume: 1070 mL Final Weight/Volume: 1.0 mL

Analysis Date: Prep Date:

03/20/2012 1739 03/19/2012 1330 RΕ

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7 US	Н	0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23	Н	0.079	0.23
Isophorone	<1.9	Н	0.27	1.9
2-Methylnaphthalene	<0.47	Н	0.12	0.47
2-Methylphenol	<1.9	Н	0.29	1.9
3 & 4 Methylphenol	<1.9	Н	0.41	1.9
Naphthalene	<0.93	Н	0.28	0.93
2-Nitroaniline	<4.7	H *	1.0	4.7
3-Nitroaniline	<9.3	Н	2.1	9.3
	<9.3	Н	3.7	9.3
4-Nitroaniline	<0.93	H	0.42	0.93
Nitrobenzene	<9.3	H H	2.0	9.3
2-Nitrophenol	<19	H *	2.2	19
4-Nitrophenol	<0.93	H	0.32	0.93
N-Nitrosodiphenylamine	<0.93	H	0.13	0.47
N-Nitrosodi-n-propylamine	<9.3	H	5.2	9.3
Pentachlorophenol	<0.93	H	0.33	0.93
Phenanthrene	•	Н	0.34	4.7
Phenol	<4.7	H	0.45	0.93
Pyrene	<0.93		0.43	1.9
1,2,4-Trichlorobenzene	<1.9	H		9.3
2,4,5-Trichlorophenol	<9.3	Н	2.1	
2,4,6-Trichlorophenol	<4.7	Н	1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	33		20 - 110
Phenol-d5	21		10 - 115
Nitrobenzene-d5	62		40 - 110
2-Fluorobiphenyl	64		50 - 110
2,4,6-Tribromophenol	67		40 - 125 50 - 125
Terphenyl-d14	86		50 - 135

LDC #: 27391B2	VALIDATION COMPLETENESS WORKSHEET	
SDG #: 500-44555-1	Level III	F
Laboratory: Test America, Inc.	<u> </u>	Revi

iewer: 2nd Reviewer:

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Technical holding times	CM	Sampling dates: 03 /01 2
11.	GC/MS Instrument performance check	<u> </u>	
. 111.	Initial calibration	SW	RSO = 30/157 r2
IV.	Continuing calibration/ICV	sw	$RSO \leq 30/159. r^2$ $1CV \mid CCV \leq 209$
V.	Blanks	<u></u>	
VI.	Surrogate spikes	ςW	
VII.	Matrix spike/Matrix spike duplicates	N	Client spec. LCS D
VIII.	Laboratory control samples	5W	LCSID
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	Ŋ	

Note:

A = Acceptable
N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate FB = Field blank

D = Duplicate TB = Trip blank EB = Equipment blank

Validated Samples: Water

1 1	JP-M13-GWMWAEHA 15	11 [500-142158-MB	21	3.	1
2 1	JP-M13-GWMWAEHA 14R	12 2	580 - 143 6 45-MB	22	33	2
3 2	JP-M13-GWMWAEHA 14RRE	13		23	33	3
4		14		24	34	4
5		15		25	3:	5
6		16		26	36	6
7		17		27	33	7
8		18		28	38	8
9		19		29	39	9
10		20		30	41	0

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	Tf. Pentachlorophenol**) K. Benzo(a)pyrene"
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	赵(Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	数K. Dibenz(a,h)anthracene
D. 1,3-Dichlarobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol⁴	WW. Carbazole)域、Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlarobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methyphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZJ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP, Benzolc Acid
3 学 4 I. X-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB, 3,3-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenal**	NN. Fluorene	(CCC, Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroanitine	DDD. &hrysene	(SSS.) Benzidine
L. Nitrobenzene	AA. 2-Chloronaphihalene	PP. 4,6-Dinitro-2-methylphenol	EEE Bis(2-ethylhexyl)phthalate	Щ.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**)天. Di-n-octylphthalate**	ດທາ
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR, 4-Bromophenyl-phenylether	රුණු. Benzo(b)fluoranthene	ww.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	H)M. Benzo(k)ítuoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

$$CKY = O$$

 $PKY = X$

LDC #: 27391B2

VALIDATION FINDINGS WORKSHEET <u>Technical Holding Times</u>

	Page:_	(of [
	Reviewer:	1	3 M	
2nd	Reviewer:			

All circled dates have exceeded the technical holding times.

N N/A Were all cooler temperatures within validation criteria?

						Total # of	
Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Days	Qua
2	Ŋ	N	03/01/12	03 19 12	13/20/12	18	1/0
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TECHNICAL HOLDING TIME CRITERIA

Water:

Extracted within 7 days, analyzed within 40 days.

Soil:

Extracted within 14 days, analyzed within 40 days.

LDC# 273182

VALIDATION FINDINGS WORKSHEET Initial Calibration

Page: of

Reviewer: 2nd Reviewer:_

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Did the laboratory conduct an acceptable 5 point calibration prior to sample analysis?

Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's? Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?

Did the initial calibration meet the acceptance criteria? Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF? Did the initial calibration meet the acceptance criteria?

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Qualifications	58-M5 JUJ/A	1				->																						
Associated Samples	A-11+500-42/58-MS	+ 500-143645-MB																										
Finding RRF (Limit: >0.05)																												
Finding %RSD (Limit: <30.0%)/(59)	17.0	25.0	e · +1	0 · 81	20. J	e. 61																						
Compound	++	808	ŅŅ	AAA	EEE	HHH																						
Standard ID	104- CMS23	187		:																								-
# Date	03 15/12	-																										
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LDC# 27391B2

SDG #:_

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Blease see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". X N N/A V N/A V N/A

Continuing Calibration

VALIDATION FINDINGS WORKSHEET

Page: (

2nd Reviewer: Reviewer:_

> Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ? Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument? Were all %D and RRFs within the validation criteria of <25 %D and ≥0.05 RRF?

Qualifications																1	JUJA					
Associated Samples	A11 + 590-14208 mg +	500-143645-MB															3 + 100- 143645-MB					
Finding RRF (Limit: >0.05)																						
Finding %D 23 (Limit: <25.8%)	20.2	21.5	23.4	22.2	20.5	20.5	25.8	20.5	22. (23.8	21.3	24.0	21.9	21.7	20.5	2).0	25.52					
Compound	M	Q	Μ	7	ΑA	G G	セセ	#	NN	A B	RR	८८	Nα	λÀ	W.W.	CCC	B					
Standard ID	1CV - CMS23																23C 0320					
# Date	2/15/12																2 20 20					

LUC #: 273/182

Sec Cont

SDG #:

N N/A

Y) N N/A

VALIDATION FINDINGS WORKSHEET Surrogate Recovery

Reviewer: Page:

2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A". (N) N/A

Were percent recoveries (%R) for surrogates within QC limits?

If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R? If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

Qualifications	3/R/A (ALL TELE)																				QC Limits (Weter)	21-100 10-123 33-110* 16-110*
%R (Limits)	3 (2020-110)	7 (10-115)	(40-110)	38 (50-110)	-		())	•	()	-			(()	()	()	()	()	QC Limits (Soil)	S6 (TBP) = 2,4,6-Tribromophenol 19-122 S7 (2CP) = 2-Chlorophenol-d4 20-130* S8 (DCB) = 1,2-Dichlorobenzene-d4 20-130*
Surrogate	2FP	PHL	NBZ	FBP																		SG (EP) = 2, SG (ZGP) = 2, ST (ZCP) = 2-6 SB (DCB) = 1,
Sample ID	2					•															QC Limits (Soil) QC Limits (Water) 35-120	S2 (FBP) = 2-Fluorobiphenyl 30-115 43-116 S3 (FPH) = Terphenyl-d14 18-137 33-141 S4 (PHL) = Phenol-d5 24-113 10-94
Date																					its are advisory = Nitrobenzene-d	= 2-Fluorobiphen = Terphenyl-d14 = Phenol-d5
*																					* QC lin S1 (NBZ)	S2 (FBP) S3 (TPH) S4 (PHL)

LDC #: 2734182

VALIDATION FINDINGS WORKSHEET Laboratory Control Samples (LCS)

Reviewer: _ Page:

2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Was a LCS required? Y ON N/A

Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	TCS/rCSD ID	Compound	LCS %R (Limits)		LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		570 - 143645 /2-A)	_	(·)	1 27 (20)	AH 10-2+	2/43/10
		,	dod	.)	_	()	_	143	
			98		_	()	_		
			LI		_	()	_		
	_)	_	()	_		
-)	_	())		
)	_	()	(.)		
)	_	())		
)	_)	()		
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)	-	(()		
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LDC #: 2734182 SDG #:

VALIDATION FINDINGS WORKSHEET

Page:

2nd Reviewer:_ Reviewer:_

Internal Standards

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard? Were all internal standard area counts within -50 to +100 of the associated calibration standard? Y Y N N N N N N N N

₹5/<u>1</u> رم رم Qualifications ¢ lαJ RT (Limits) 276691 (284090-1136358 218084 (342810 - 68561 Area (Limits) Internal Standard CRY PRY Sample ID Date *

IS1 (DCB) = 1,4-Dichlorobenzene-d4 IS2 (NPT) = Naphthalene-d8 IS3 (ANT) = Acenaphthene-d10 * QC limits are advisory

IS4 (PHN) = Phenanthrene-d10 IS5 (CRY) = Chrysene-d12 IS6 (PRY) = Perylene-d12

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: March 1, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Dissolved Metals

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44555-1

Sample Identification

JP-M13-GWMWAEHA 15 JP-M13-GWMWAEHA 14RMS JP-M13-GWMWAEHA 14RMSD JP-M13-GWMWAEHA 14RDUP

Introduction

This data review covers 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B and 7470A for Dissolved Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

ICP-MS was not utilized in this SDG.

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No dissolved metal contaminants were found in the initial, continuing and preparation blanks.

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW

Dissolved Metals - Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW

Dissolved Metals - Laboratory Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW

Dissolved Metals - Field Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-44555-1

Client Sample ID:

JP-M13-GWMWAEHA 15

Lab Sample ID:

500-44555-1

Client Matrix:

Water

Date Sampled: 03/01/2012 0900

Date Received: 03/01/2012 1505

6010B Metals (ICP)-Dissolved

Analysis Method: Prep Method:

6010B 3010A

Analysis Batch: Prep Batch:

500-142619

Lab File ID:

Instrument ID:

ICP5 P50307B

500-142171

Initial Weight/Volume: 50 mL

Dilution: Analysis Date: 1.0

03/07/2012 1941

Prep Date:

03/02/2012 0800

Final Weight/Volume:

50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	5.7		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	0.0076	J	0.0024	0.010
Barium	0.10		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	140		0.087	0.20
Chromium	0.0088	J	0.00096	0.010
Cobalt	0.0066		0.0010	0.0050
Copper	0.013		0.0011	0.010
Iron	15		0.070	0.20
Lead	0.012		0.0016	0.0050
Magnesium	77		0.024	0.10
Manganese	0.54		0.0011	0.010
Nickel	0.013		0.0019	0.010
Potassium	4.6		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	20		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.014		0.00062	0.0050
	•		0.0047	0.020
ZHO				
Zinc	0.029		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: 7470A Prep Method:

7470A

Dilution: Analysis Date:

1.0 03/07/2012 0908

03/06/2012 1415

Analysis Batch: Prep Batch:

500-142537 500-142429

Instrument ID:

Lab File ID:

HG6 030712R.CSV

Initial Weight/Volume: Final Weight/Volume: 25 mL

25 mL

Analyte Mercury

Prep Date:

Result (ug/L) <0.20

Qualifier

MDL 0.070 RL 0.20

Job Number: 500-44555-1 Client: Toltest Inc.

Client Sample ID: JP-M13-GWMWAEHA 14R

Date Sampled: 03/01/2012 1200 Lab Sample ID: 500-44555-2 Date Received: 03/01/2012 1505 Water Client Matrix:

6010B Metals (ICP)-Dissolved

6010B Analysis Method: 3010A Prep Method:

Dilution: 1.0

03/07/2012 1947 Analysis Date: 03/02/2012 0800 Prep Date:

Analysis Batch: 500-142619 Prep Batch: 500-142171

Instrument ID: Lab File ID: Initial Weight/Volume:

ICP5 P50307B 50 mL

Final Weight/Volume: 50 mL

Analyte		Result (m	ıg/L)	Qualifie	r MDL		RL
Aluminum	······································	0.027		J	0.025		0.20
Antimony		<0.020			0.0026		0.020
Arsenic		<0.010			0.0024		0.010
Barium		0.089			0.00044		0.010
Beryllium		< 0.0040			0.00044		0.0040
Cadmium		< 0.0020			0.00054		0.0020
Calcium		110			0.087		0.20
Chromium		< 0.010			0.00096		0.010
Cobalt		< 0.0050			0.0010		0.0050
Copper		0.0012		J	0.0011		0.010
Iron		<0.20			0.070		0.20
Lead		< 0.0050			0.0016		0.0050
Magnesium		50			0.024		0.10
Manganese		0.0019		J	0.0011		0.010
Nickel		< 0.010			0.0019		0.010
Potassium		12			0.070		0.50
Selenium		< 0.010			0.0027		0.010
Silver		< 0.0050			0.0011		0.0050
Thallium		<0.010			0.0013		0.010
Vanadium		0.0029		J	0.00062		0.0050
Zinc		<0.020			0.0047		0.020
A I T. BALER - II	C040D	Analysis Batch:	500-142761	1	Instrument ID:	ICP:	5
Analysis Method:	6010B	•		•	Lab File ID:		308C
Prep Method:	3010A	Prep Batch:	500-142171				mL
Dilution:	5.0				Initial Weight/Volume:		
Analysis Date:	03/09/2012 0344				Final Weight/Volume:	50	mL
Prep Date:	03/02/2012 0800						
Analyte		Result (m	ng/L)	Qualifie			RL
Sodium	and the control of th	50			0.60		5.0

7470A Mercury (CVAA)-Dissolved

Analysis Method: 7470A Prep Method: 7470A

Dilution: 1.0

03/07/2012 0910 Analysis Date: Prep Date: 03/06/2012 1415

Analysis Batch: 500-142537 500-142429 Prep Batch:

Instrument ID:

HG6 030712R.CSV

Lab File ID: Initial Weight/Volume: 25 mL

Final Weight/Volume: 25 mL

RL Qualifier MDL Result (ug/L) Analyte 0.20 0.070 <0.20 Mercury

SDG Labor	#: 500-44555-1 atory: <u>Test America, Inc.</u>	_			Level III	4704	2	Page: <u>l_of_l</u> Reviewer: <u>M &</u> nd Reviewer: <u>l </u>
	ratory: Test America, Inc. HOD: Dissolved Metals (EPamples listed below were retion findings worksheets.	A SW 840	6 Meth or each	od 6010	iB/70/20) following val	idation areas. \	/alidation findings	are noted in attache
	Validation A	rea					Comments	
I.	Technical holding times	· 		Α	Sampling da	tes: 3 - 1	-12	
<u>II.</u>	ICP/MS Tune			7	not	utilized	l	
III.	Calibration			Α				
IV.	Blanks			Α				-0
V.	ICP Interference Check Sample	e (ICS) Ana	lysis	A				
VI.	Matrix Spike Analysis			A	Ms/	MSD	w	
VII.	Duplicate Sample Analysis			Α	4 n			
VIII.	Laboratory Control Samples (L	CS)		Α	LCS			
IX.	Internal Standard (ICP-MS)			N	not	utilized		
Χ.	Furnace Atomic Absorption QC	;		N	11	ч(
XI.	ICP Serial Dilution			_A_				
XII.	Sample Result Verification			N				
XIII.	Overall Assessment of Data			Ą				
XIV.	Field Duplicates			N				
ΧV	Field Blanks			N				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	R	ID = No (:= Rinsa B = Field	ite	is detected	D = Duplicat TB = Trip bla EB = Equipr	ank	
	ed Samples: <u>all</u> water	· · · · · · · · · · · · · · · · · · ·	. ,					
1	JP-M13-GWMWAEHA 15	11			21		31	
2	JP-M13-GWMWAEHA 14R	12			22		32	·
3	JP-M13-GWMWAEHA 14RMS	13			23		33	WEA
4	JP-M13-GWMWAEHA 14RMSD	14			24		34	
5	JP-M13-GWMWAEHA 14RDUP	15			25		35	
6		16			26		36	
7		17			27		37	
8		18			28		38	
9		19			29		39	
10		20 0	BW		30		40	
Notes								

VALIDATION COMPLETENESS WORKSHEET

LDC #:_

27391B4

LDC#: 2739134

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page:_	of
Reviewer:_	MG
2nd reviewer:_	<u> </u>

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1,2	W	(Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Ti, V, Zn) Mo, B, Si, CN
OC 375	ļ	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn) Hg Ni, K, Se, Ag, Na, Tl, V, Zn) Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN',
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
ļ		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
ļ		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
ļ		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
ļ ,		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN-
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Ai, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Analysis Method
ICP	~	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn) Hg(Ni, K, Se, Ag, Na, Tl, V, Zn) Mo, B, Si, CN.
ICP-MS		Ai, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ .
GEAA	<u> </u>	At Sh. As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Ph, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tt, V, Zn, Mo, B, Si, CN

Comments:_		med	 	
	· · · · · · · · · · · · · · · · · · ·		 •	

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: March 1, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level !!!

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44555-1

Sample Identification

JP-M13-GWMWAEHA 15 JP-M13-GWMWAEHA 14R

Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Dissolved Nitrate as Nitrogen and Dissolved Sulfate.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Calibration Verification

Calibration verification frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VI. Duplicates

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW

Wet Chemistry - Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW

Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW

Wet Chemistry - Field Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

Client: Toltest Inc. Job Number: 500-44555-1

General Chemistry

Client Sample ID: JP-M13-GWMWAEHA 15

Lab Sample ID: Street Matrix:

500-44555-1

Water

Date Sampled: 03/01/2012 0900

Date Received: 03/01/2012 1505

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.13		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-	142165	Analysis Date	: 03/01/2	012 1812			
Sulfate-Dissolved	12		mg/L	0.90	2.0	10	300.0
Analysis Batch: 500-	142165	Analysis Date	: 03/01/2	012 1826			

03/22/2012

Client: Toltest Inc. Job Number: 500-44555-1

General Chemistry

Client Sample ID: JP-M13-GWMWAEHA 14R

Lab Sample ID:

500-44555-2

Client Matrix:

Water

Date Sampled: 03/01/2012 1200

Date Received: 03/01/2012 1505

Qual Units MDL RL Dil Method Result Analyte 0.023 0.10 1.0 300.0 Nitrate as N-Dissolved mg/L 1.7 Analysis Batch: 500-142165 Analysis Date: 03/01/2012 1841 300.0 Sulfate-Dissolved 140 mg/L 1.8 4.0 20

Analysis Batch: 500-143904 Analysis Date: 03/20/2012 2005

03/22/201

SDG#	:27391B6 t:500-44555-1 atory:_ <u>Test America, Inc.</u>	_	LIDATIO		PLETEN Level III	ESS	S WORKSHEET	F 2nd F	Date: 4-5-13 Page: 1 of 1 Reviewer: MG Reviewer: L
METH	OD: Dissolved Nitrate-N	I, Dis	solved Sulfa	ate (EPA N	Method 30	0.0)			·
The sa /alidat	amples listed below were ion findings worksheets	e revie	ewed for ea	ch of the f	ollowing v	alida	tion areas. Validatio	on findings are	noted in attached
	Validation	Area				·	Comm	ents	
l.	Technical holding times			A	Sampling	dates:	3-1-12		
11	Initial calibration			Α					
III.	Calibration verification			A					
_IV	Blanks			Α				_	
V	Matrix Spike/Matrix Spike D	uplicat	es	N	clie	nt	specified		
VI.	Duplicates			N	tr				
VII.	Laboratory control samples			Α	LCS				
VIII.	Sample result verification			N					_
IX.	Overall assessment of data			Α					
X.	Field duplicates			N					
ΧI	Field blanks			N					
lote: ∕alidate	A = Acceptable N = Not provided/applicable SW = See worksheet d Samples:	•	R = Rins	o compound sate eld blank	s detected		D = Duplicate TB = Trip blank EB = Equipment blan	k	
T	all water			"- "- "- "- "- " " - " " - " " - " " - "		П		 	
	JP-M13-GWMWAEHA 15	11			21	<u> </u>		31	
	JP-M13-GWMWAEHA 14R	12			22			32	
3		13			23		# - III-	33	
4		14			24			34	
5		15			25	<u> </u>	.=	35	
6		16	•		26	<u> </u>		36	
7		17			27			37	
8		18	S0 /		28	 		38	
9		19	PBW I		29	<u> </u>	·	39	
10		20	PBW)		30			40	

Notes:_

LDC#: 27391B6

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	<u>l_of_l_</u>
Reviewer:	MG
2nd reviewer:	V

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1,7	W	PH TDS CI F (NO3)NO2 (SO4)PO4 ALK CN' NH3 TKN TOC CR8+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR5+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CNT NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR5+ CIO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CRS+ CIO4
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		ph tds ci f No3 No2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ CIO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
,		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR5+ ClO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
	· · · · · · · · · · · · · · · · · · ·	pH TDS CLF NO3 NO2 SO4 PO4 ALK CN' NH3 TKN TOC CR8+ ClO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR5+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CLE NO, NO, SO, PO, ALK CN' NH, TKN TOC CR6+ CIO.

Comments:	 	

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: March 1, 2012

LDC Report Date: April 5, 2012

Matrix: Water

Parameters: Explosives

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-44555-1

Sample Identification

JP-M13-GWMWAEHA 15 JP-M13-GWMWAEHA 14R

Introduction

This data review covers 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW

Explosives - Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW

Explosives - Laboratory Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

JOAAP-GW

Explosives - Field Blank Data Qualification Summary - SDG 500-44555-1

No Sample Data Qualified in this SDG

Analytical Data

Job Number: 500-44555-1 Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMWAEHA 15

Lab Sample ID:

Prep Date:

500-44555-1

Client Matrix: Water Date Sampled: 03/01/2012 0900 Date Received: 03/01/2012 1505

8330 Nitroaromatics a	nd Nitramines	(HPLC)
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Analysis Batch: 500-142553 Instrument ID: INST39-40 Analysis Method: 8330 500-142545 Initial Weight/Volume: 770 mL 3535 Prep Batch: Prep Method: Final Weight/Volume: 6.0 mL Dilution: 1.0 Injection Volume: 100 uL Analysis Date: 03/08/2012 0221

Result Type: PRIMARY 03/07/2012 0840

Qualifier MDL RL Result (ug/L) Analyte <0.31 0.12 0.31 **HMX** 0.077 0.16 < 0.16 RDX 0.16 < 0.16 0.039 1.3.5-Trinitrobenzene 0.16 0.033 < 0.16 1,3-Dinitrobenzene 0.032 0.16 < 0.16 Nitrobenzene 0.036 0.16 < 0.16 2,4,6-Trinitrotoluene 0.39 < 0.39 0.065 Tetryl 0.032 0.31 < 0.31 2,4-Dinitrotoluene 0.31 < 0.31 0.071 2,6-Dinitrotoluene 0.035 0.31 2-Amino-4,6-dinitrotoluene < 0.31 0.31 0.074 < 0.31 4-Amino-2,6-dinitrotoluene 0.31 0.082 < 0.31 2-Nitrotoluene 0.082 0.31 < 0.31 4-Nitrotoluene 0.31 < 0.31 0.14 3-Nitrotoluene Qualifier Acceptance Limits %Rec Surrogate

1,2-Dinitrobenzene 103

70 - 130

Analytical Data

Client: Toltest Inc. Job Number: 500-44555-1

Client Sample ID:

JP-M13-GWMWAEHA 14R

Lab Sample ID:

500-44555-2

Client Matrix:

Water

Date Sampled: 03/01/2012 1200 Date Received: 03/01/2012 1505

Client Iviatrix:	vvater				Date Ne	CCIVCO. 00/01/2012 1000
		8330 Nitroaromatics	and Nitramir	nes (HP	LC)	
Analysis Method: Prep Method: Dilution: Analysis Date: Prep Date:	8330 3535 1.0 03/08/2012 0313 03/07/2012 0840	5 Prep Batch: 500-142545 08/2012 0313				INST39-40 770 mL 6.0 mL 100 uL PRIMARY
Analyte		Result (u	g/L)	Qualifie	r MDL	RL
HMX		<0.31		····	0.12	0.31
RDX		<0.16			0.077	0.16
1,3,5-Trinitrobenze	ene	<0.16			0.039	0.16
1,3-Dinitrobenzene	3	<0.16			0.033	0.16
Nitrobenzene		<0.16			0.032	0.16
2,4,6-Trinitrotoluer	ne	<0.16			0.036	0.16
Tetryl		< 0.39			0.065	0.39
2,4-Dinitrotoluene		<0.31			0.032	0.31
2,6-Dinitrotoluene		<0.31			0.071	0.31
2-Amino-4,6-dinitro	otoluene	0.79			0.035	0.31
4-Amino-2,6-dinitro	otoluene	1.1			0.074	0.31
2-Nitrotoluene		<0.31			0.082	0.31
4-Nitrotoluene		<0.31			0.082	0.31
3-Nitrotoluene		<0.31			0.14	0.31
Surrogate		%Rec		Qualifie	r Accepta	nce Limits
1,2-Dinitrobenzene	9	107			70 - 130	

oulda

SDG #	t: 27391B40 #: 500-44555-1 atory: Test America, Inc	_	ALIDATIO		PLETEN Level III		WORKSHE	ET	Date: 4 03 Page: 1 of 1 Reviewer: 1
	IOD: HPLC Explosives (SW 846 Me	thod 8330))				2nd Reviewer:
	amples listed below were tion findings worksheets		ewed for ea	ch of the f	following v	validati	on areas. Valid	lation find	ings are noted in attached
	Validation	Area					Co	mments	
l.	Technical holding times			A	Sampling	dates:	3/01/12		
11	Initial calibration			A	1- RSD		' '		
111,	Calibration verification/ICV			A	1. D =				
IV.	Blanks			A					
V	Surrogate recovery			A					
VI.	Matrix spike/Matrix spike du	plicate	es	NI	1. ,				
VII.	Laboratory control samples			A XXX	40412 LCS	0 NL	۸	· · · · · · · · · · · · · · · · · · ·	
VIII.	Target compound identifica			N)		
IX.	Compound quantitation/RL/	LOQ/L	.ODs	N					***
X.	System Performance			N				· · ·	
XI.	Overall assessment of data)		A					
XII.	Field duplicates			2					
XIII.	Field blanks			2					
Note: Validate	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples: WATER	e	R = Rin	o compound	s detected		D = Duplicate TB = Trip blank EB = Equipment	blank	
1	JP-M13-GWMWAEHA 15	11	142549	MB	21			31	
2	JP-M13-GWMWAEHA 14R	12			22			32	
3		13			23			33	
4		14			24			34	
5		15			25			35	
6		16			26			36	
7		17			27			37	
8		18			28			38	

Notes:		

LDC Validation Report #27595

(April 2012 Samples)



Laboratory Data Consultants, Inc.

7750 El Camino Real, Ste. 2L Carlsbad, CA 92009

Phone 760.634.0437

Web www.lab-data.com

Fax 760.634.0439

Toltest.

May 23, 2012

5201 Jewell Lane Poducah KY 42001 ATTN: Mr. Gary Reside

SUBJECT:

JOAAP-GW, Data Validation

Dear Mr. Reside,

Enclosed is the final validation report for the fractions listed below. This SDG was received on May 7, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27595:

SDG#

Fraction

500-45420-1

Dissolved Metals, Explosives

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan(QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. Rev. 0 July 2009
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1, April 2009
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Project Manager/Chemist

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		≥	+	-	\vdash	_								+	+	+	+	\dashv	-	\dashv	+	+	+	\dashv	\dashv	\dashv	_	\vdash			\vdash	-I
	_	_ν	\perp		_			_							_	4	4	4	_	_	4	\dashv	+	\dashv	-	-					\vdash	0
		≥															_		\perp		_	_	_	4	_						\vdash	0
		တ																														0
		≥											154																			0
		S																														0
		3																														0
-		S	1	+	T																											0
	-	3	\dagger	+	\dagger		T																									0
_		S	+	+	+		\vdash	1								7																0
	-	+	+	+	╁	\vdash	\vdash	╁		\vdash					\dashv	_	\dashv															0
_		≥	+	+	╁	╁	\vdash	╁		-	-				\dashv	\dashv	\dashv	-					-					\vdash	\vdash		\vdash	0
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		≥	+	_	-	\vdash	\vdash	_	_	_	_	_				\dashv	\dashv						\dashv				-	\vdash	-	-		$-\parallel$
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LDC #27595 (Toltest-Poducah,KY / JOAAP-GW)	İ	3			T																											0
ah,		S				1	T	1			T																					0
nc		3	+	+	+	+	†	\dagger	T	T	T																					0
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Tol	-	S	+	_	+	+	+	+	+	+	+	-	╁	-	-			-	-	-	\vdash	-			┝	┢	╁	+	╁	+	+	0
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29		S	4		_	_	\downarrow	_	_	\perp	+	-	-	_					-	-	-	_			┝	╀	╀	+	╀	╀	+	-
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Level III EDD	SDG#	Matrix: Water/Soil	500-45420-1																													A/CR
Lev	» ا	Wat	500-																													
		i.X:		_	_	_	\perp	+	\bot	+	+	_	+	+	+	+	+	+	+	+	+	+	-	\vdash	+	+	+	+	+	+	+	
	LDC	Mat	⋖																													Total

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

JOAAP-GW

Collection Date:

April 10 through April 11, 2012

LDC Report Date:

May 16, 2012

Matrix:

Water

Parameters:

Dissolved Metals

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45420-1

Sample Identification

JP-L3-SW557-0412

JP-L3-SW558-0412

JP-L3-GWMW631-0412

JP-L3-GWMW630-0412

JP-L3-GWMW999-0412

JP-L3-GWMW412-0412

JP-L3-GWMW633-0412

JP-L3-SW777-0412

Introduction

This data review covers 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B and 7470A for Dissolved Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

ICP-MS was not utilized in this SDG.

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No dissolved metal contaminants were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples				
PB (prep blank)	Copper	0.00549 mg/L	All samples in SDG 500-45420-1				

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
JP-L3-SW557-0412	Copper	0.023 mg/L	0.023U mg/L
JP-L3-SW558-0412	Copper	0.0066 mg/L	0.0066U mg/L
JP-L3-GWMW631-0412	Copper	0.015 mg/L	0.015U mg/L
JP-L3-GWMW630-0412	Copper	0.027 mg/L	0.027U mg/L
JP-L3-GWMW999-0412	Copper	0.020 mg/L	0.020U mg/L

Sample	Analyte	Reported Concentration	Modified Final Concentration
JP-L3-GWMW412-0412	Copper	0.026 mg/L	0.026U mg/L
JP-L3-GWMW633-0412	Copper	0.023 mg/L	0.023U mg/L
JP-L3-SW777-0412	Соррег	0.0041 mg/L	0.0041U mg/L

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike/(Matrix Spike) Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was not performed by the laboratory.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

Samples JP-L3-GWMW630-0412 and JP-L3-GWMW999-0412 were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

	Concentration (mg/L)					
Analyte	JP-L3-GWMW630-0412	JP-L3-GWMW999-0412	RPD (Limits)	Difference (Limits)	Flags	A or P
Barium	0.011	0.011	-	0 (≤0.020)	-	<u>-</u>
Cadmium	0.00078	0.00087	-	0.00009 (≤0.040)	-	-
Calcium	83	84	1 (≤25)	-	-	-
Copper	0.027	0.020	-	0.007 (≤0.020)	-	-
Magnesium	43	44	2 (≤25)	-	-	-
Manganese	0.033	0.032	_	0.001 (≤0.020)	-	-
Potassium	4.4	4.4	0 (≤25)	-	-	-
Sodium	22	22	0 (≤25)	-	-	-
Zinc	0.0087	0.020U	-	0.0113 (≤0.040)	-	-

JOAAP-GW Dissolved Metals - Data Qualification Summary - SDG 500-45420-1

No Sample Data Qualified in this SDG

JOAAP-GW Dissolved Metals - Laboratory Blank Data Qualification Summary - SDG 500-45420-1

SDG	Sample	Analyte	Modified Final Concentration	A or P
500-45420-1	JP-L3-SW557-0412	Copper	0.023U mg/L	А
500-45420-1	JP-L3-SW558-0412	Copper	0.0066U mg/L	Α
500-45420-1	JP-L3-GWMW631-0412	Copper	0.015U mg/L	Α
500-45420-1	JP-L3-GWMW630-0412	Copper	0.027U mg/L	А
500-45420-1	JP-L3-GWMW999-0412	Copper	0.020U mg/L	А
500-45420-1	JP-L3-GWMW412-0412	Copper	0.026U mg/L	А
500-45420-1	JP-L3-GWMW633-0412	Copper	0.023U mg/L	А
500-45420-1	JP-L3-SW777-0412	Copper	0.0041U mg/L	

JOAAP-GW

Dissolved Metals - Field Blank Data Qualification Summary - SDG 500-45420-1

No Sample Data Qualified in this SDG

Client Sample ID: JP-L3-SW557-0412	Lab Sample ID: 500-45420-1
Lab Name: TestAmerica Chicago	Job No.: 500-45420-1
SDG ID.:	
Matrix: Water	Date Sampled: 04/10/2012 16:40
Reporting Basis: WET	Date Received: 04/12/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L	T T		1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.039	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00085	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	75	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.023	0.010	0.0011	mg/L		В	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	39	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	0.072	0.010	0.0011	mg/L			1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	1.4	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L		<u> </u>	1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	15	1.0	0.12	mg/L	1		1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L	<u> </u>	-	1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	<0.020	0.020	0.0047	mg/L	1		1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L		1	1	7470A

025/21/12

Client Sample ID: JP-L3-SW558-0412	Lab Sample ID: 500-45420-2
Lab Name: TestAmerica Chicago	Job No.: 500-45420-1
SDG ID.:	
Matrix: Water	Date Sampled: 04/10/2012 16:20
Penorting Basis: WET	Date Received: 04/12/2012 09:00

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CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L		1	1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L	 		1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.042	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00079	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	80	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.0066	0.010	0.0011	mg/L	J	В	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	43	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	0.0027	0.010	0.0011	mg/L	J		1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	1.0	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	6.2	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L			1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	<0.020	0.020	0.0047	mg/L			1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L			1	7470A

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Client Sample ID: JP-L3-GWMW631-0412	Lab Sample ID: 500-45420-3
Lab Name: TestAmerica Chicago	Job No.: 500-45420-1
SDG ID.:	
Matrix: Water	Date Sampled: 04/11/2012 09:40
Penarting Rasis: WET	Date Received: 04/12/2012 09:00

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CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L			1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.017	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00082	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	67	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.015	0.010	0.0011	mg/L		В	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	36	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	0.022	0.010	0.0011	mg/L			1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	4.9	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	28	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L		-	1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	<0.020	0.020	0.0047	mg/L			1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L			1	7470A

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Client Sample ID: JP-L3-GWMW630-0412	Lab Sample ID: 500-45420-4
Lab Name: TestAmerica Chicago	Job No.: 500-45420-1
SDG ID.:	
Matrix: Water	Date Sampled: 04/11/2012 10:15
Reporting Basis: WET	Date Received: 04/12/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	С	Q -	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L			1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.011	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00078	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	83	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.027	0.010	0.0011	mg/L		В	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	43	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	0.033	0.010	0.0011	mg/L			1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	4.4	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	22	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L			1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	601 0 B
7440-66-6	Zinc	0.0087	0.020	0.0047	mg/L	J		1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L	1		1	7470A

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Client Sample ID: JP-L3-GWMW999-0412	Lab Sample ID: 500-45420-5
Lab Name: TestAmerica Chicago	Job No.: 500-45420-1
SDG ID.:	
Matrix: Water	Date Sampled: 04/11/2012 12:00
Reporting Basis: WET	Date Received: 04/12/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L	1	1	1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.011	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00087	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	84	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.020	() 0.010	0.0011	mg/L		В	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	44	0.10	0.024	mg/L	1	<u> </u>	1	6010B
7439-96-5	Manganese	0.032	0.010	0.0011	mg/L		1	1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	4.4	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L	1		1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	22	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L	-	1	1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	<0.020	0.020	0.0047	mg/L	<u> </u>		1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L			1	7470A

025/21/2

Client Sample ID: JP-L3-GWMW412-0412	Lab Sample ID: 500-45420-7
Lab Name: TestAmerica Chicago	Job No.: 500-45420-1
SDG ID.:	
Matrix: Water	Date Sampled: 04/11/2012 12:10
Reporting Basis: WET	Date Received: 04/12/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L			1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.042	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.0011	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	96	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.026	0.010	0.0011	mg/L		В	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	51	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	<0.010	0.010	0.0011	mg/L			1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	1.0	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L		1	1	6010B
7440-23-5	Sodium	7.7	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L			1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	<0.020	0.020	0.0047	mg/L			1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L			1	7470A

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Client Sample ID: JP-L3-GWMW633-0412	Lab Sample ID: 500-45420-8
Lab Name: TestAmerica Chicago	Job No.: 500-45420-1
SDG ID.:	
Matrix: Water	Date Sampled: 04/11/2012 13:05
Reporting Basis: WET	Date Received: 04/12/2012 09:00

	-	Result	RL	MDL	Units	С	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L	1		1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.047	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00079	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	83	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.023	0.010	0.0011	mg/L	1	В	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	37	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	<0.010	0.010	0.0011	mg/L			1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	1.0	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	5.7	1.0	0.12	mg/L	1		1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L		1	1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	<0.020	0.020	0.0047	mg/L			1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L			1	7470A

025/21/12

Client Sample ID: JP-L3-SW777-0412	Lab Sample ID: 500-45420-9
Lab Name: TestAmerica Chicago	Job No.: 500-45420-1
SDG ID.:	
Matrix: Water	Date Sampled: 04/11/2012 13:25
Reporting Basis: WET	Date Received: 04/12/2012 09:00

CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L			1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.039	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00087	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	73	0.20	0.087	mg/L			1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L	1		1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.0041	() 0.010	0.0011	mg/L	J	В	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439-95-4	Magnesium	39	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	0.060	0.010	0.0011	mg/L			1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	1.4	0.50	0.070	mg/L	1		1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	14	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L			1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	0.0087	0.020	0.0047	mg/L	J		1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L			1	7470A

05/01/2012

			······	<u> </u>	T							
	Validatio	n Area			Comments							
1.	Technical holding times			Α	Sampling dates: 4-10-12 through 4-11							
11.	. ICP/MS Tune			7	not u	tilized						
111.	l. Calibration			Α		· · · · · · · · · · · · · · · · · · ·						
IV	/. Blanks			SW								
	. ICP Interference Check Sa	ample (IC	S) Analysis	A								
VI	I. Matrix Spike Analysis	···		N	clien	t specified						
VII	I. Duplicate Sample Analysis	Duplicate Sample Analysis				N						
VII	II. Laboratory Control Sample	es (LCS)		Α	LCS							
ıx	C. Internal Standard (ICP-MS	Internal Standard (ICP-MS)				tilized						
<u> x</u> .	Furnace Atomic Absorptio		7	li,	(1							
ΧI	I. ICP Serial Dilution		N	not p	erformed							
XII	Sample Result Verification	Sample Result Verification										
XII	II. Overall Assessment of Da	Overall Assessment of Data										
ΧIV	V. Field Duplicates			SW	D= 4	+5						
χ١	V Field Blanks			7								
Note: Valida	: A = Acceptable N = Not provided/applicab SW = See worksheet ated Samples: A !! Water	ole	R = Rin	o compound sate eld blank	s detected	D = Duplicate TB = Trip blank EB = Equipment b	olank					
1	JP-L3-SW557-0412	11			21		31					
2	JP-L3-SW558-0412	12			22		32					
3	JP-L3-GWMW631-0412	13			23		33					
4	JP-L3-GWMW63 3 -0412	14			24		34					
5	JP-L3-GWMW999-0412	15			25		35					
6	JP-L3-GWMW412-0412	16			26		36					
7	JP-L3-GWMW633-0412	17			27		37					
8	JP-L3-SW777-0412	18			28		38					
9		19			29		39					
10		20	PBW		30		40					

Level III

MY.

LDC #: 27595A4 VALIDATION COMPLETENESS WORKSHEET

SDG #: 500-45420-1

Laboratory: Test America, Inc.

Date: 5-11-12

Page: [of [

Reviewer: MG 2nd Reviewer:

LDC#: 27595A4

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page:_	<u>l_of_l</u>
Reviewer:_	MG
2nd reviewer:	V

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-78	W	(Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn) Mo, B, Si, CN-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
	· ·	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
!		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
1		Analysis Method
ICP	~	(Al. Sb. As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn) Hg, (Ni, K, Se, Ag, Na, Tl, V, Zn) Mo, B, Si, CN,
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
GEAA		Al, Sh, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, 7n, Mo, B, Si, CN ⁻ ,

GFAA		AL	Sb	As,	Ba, I	Be, Co	l, Ca	Cr	Co.	Сu,	Fe.	Рb,	Mg.	Mn,	Нg	Ni,	ĸ	Se,	Aq.	Na,	TI,	V. 7	Žn,	Mo	В	Si	 1-,	
Comments:_	Mercury	/ by	CV	4A if	per	forme	<u>a</u>																					

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000) Sample Concentration units, unless otherwise noted: mg/L SDG #: See Cover LDC #: 27595A4

VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

Associated Samples:_

Soil preparation factor applied: NA

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Page:	Reviewer: /	2nd Reviewer:
		7

8	0.0041
7	0.023
9	0.026
r.	0.020
4	0.027
က	0.015
2	0.0066
\$ -	0.023
Action Limit	0.02745
Maximum Maximum PB* ICB/CCB* (mg/L)	
Maximum PB ^a (mg/L)	0.00549
Maximum PB ^a (mg/Kg)	
Analyte	Cu

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC#: <u>27595</u>A4

VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

Page: <u> (</u>	_of
Reviewer:_	MG
2nd Reviewer:	_مل

METHOD: Metals (EPA Method 6010B/6020/7000)

(Y)N NA (Y)N NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentration (mg/L)		(≤25)	(mg/L)	(mg/L)	Qualifications
Analyte	4	5	RPD	Difference	Limits	(Parent Only)
Barium	0.011	0.011		0	(≤0.020)	
Cadmium	0.00078	0.00087		0.00009	(≤0.0040)	
Calcium	83	84	1			
Copper	0.027	0.020		0.007	(≤0.020)	
Magnesium	43	44	2			
Manganese	0.033	0.032		0.001	(≤0.020)	
Potassium	4.4	4.4	0	4		
Sodium	22	22	0			
Zinc	0.0087	0.020U		0.0113	(≤0.040)	

V:\FIELD DUPLICATES\FD_inorganic\27595A4.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

JOAAP-GW

Collection Date:

April 10 through April 11, 2012

LDC Report Date:

May 23, 2012

Matrix:

Water

Parameters:

Explosives

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45420-1

Sample Identification

JP-L3-SW557-0412

JP-L3-SW558-0412

JP-L3-GWMW631-0412

JP-L3-GWMW630-0412

JP-L3-GWMW999-0412

JP-L3-GWMW410-0412

JP-L3-GWMW412-0412

JP-L3-GWMW633-0412

JP-L3-SW777-0412

JP-L1-GWMW174-0412

JP-L1-GWMWWES3-0412

JP-L1-GWMW173-0412

Introduction

This data review covers 12 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for sample 23173-SB-022W. Since the sample was diluted out, no data were qualified.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
LCS/D500-146630/2-A (All samples in SDG 500-45420-1)	нмх	116 (80-115)	121 (80-115)	-	J (all detects)	Р

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation and RLs

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
JP-L3-GWMW630-0412	4-Amino-2,6-dinitrotoluene 2-Amino-4,6-dinitrotoluene	47.9 53.3	J (all detects) J (all detects)	А
JP-L3-GWMW999-0412	4-Amino-2,6-dinitrotoluene 2-Amino-4,6-dinitrotoluene	61.7 58.1	J (all detects) J (all detects)	А
JP-L3-GWMW412-0412	1,3,5-Trinitrobenzene	51.3	J (all detects)	

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

Samples JP-L3-GWMW630-0412 and JP-L3-GWMW999-0412 were identified as field duplicates. No explosives were detected in any of the samples with the following exceptions:

	Concentra					
Compound	JP-L3-GWMW630-0412	JP-L3-GWMW999-0412	RPD (Limits)	Difference (Limits)	Flags	A or P
нмх	4.7	4.7	0 (≤25)	-	-	-
2-Amino-4,6-dinitrotoluene	0.077	0.072	_	0.005 (≤0.31)	-	-
4-Amino-2,6-dinitrotoluene	0.18	0.15	-	0.03 (≤0.31)	<u>-</u>	-
RDX	8.7	8.7	0 (≤25)	-	-	4

JOAAP-GW Explosives - Data Qualification Summary - SDG 500-45420-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45420-1	JP-L3-SW557-0412 JP-L3-SW558-0412 JP-L3-GWMW631-0412 JP-L3-GWMW999-0412 JP-L3-GWMW410-0412 JP-L3-GWMW412-0412 JP-L3-GWMW633-0412 JP-L3-SW777-0412 JP-L1-GWMW174-0412 JP-L1-GWMWWES3-0412 JP-L1-GWMWWES3-0412	НМХ	J (all detects)	Р	Laboratory control samples (%R)
500-45420-1	JP-L3-GWMW630-0412 JP-L3-GWMW999-0412	4-Amino-2,6-dinitrotoluene 2-Amino-4,6-dinitrotoluene	J (all detects) J (all detects)	Α	Compound quantitation and RLs (column difference)
500-45420-1	JP-L3-GWMW412-0412	1,3,5-Trinitrobenzene	J (all detects)	Α	Compound quantitation and RLs (column difference)

JOAAP-GW

Explosives - Laboratory Blank Data Qualification Summary - SDG 500-45420-1

No Sample Data Qualified in this SDG

JOAAP-GW

Explosives - Field Blank Data Qualification Summary - SDG 500-45420-1

No Sample Data Qualified in this SDG

Job Number: 500-45420-1 Client: Toltest Inc.

JP-L3-SW557-0412 Client Sample ID:

500-45420-1 Lab Sample ID:

Client Matrix: Water

Date Sampled: 04/10/2012 1640 Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: 8330 Prep Method: 3535

Dilution:

Analysis Date:

Prep Date:

1.0

Prep Batch:

Analysis Batch: 500-146545 500-146630 Instrument ID: Initial Weight/Volume: 770 mL Final Weight/Volume:

INST35-36 6.0 mL

Injection Volume: Result Type:

100 uL PRIMARY

04/18/2012 0144 04/17/2012 0940

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	1.1 5	**************************************	0.12	0.31
RDX	3.2	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2.4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
	ND	Ovelifier	Apports	neo Limite
Surrogate	%Rec	Qualifier	· · · · · · · · · · · · · · · · · · ·	nce Limits
1,2-Dinitrobenzene	112		70 - 130)

orstalr

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID:

JP-L3-SW558-0412

Lab Sample ID:

500-45420-2

04/18/2012 0218

04/17/2012 0940

Client Matrix:

Water

Date Sampled: 04/10/2012 1620

Date Received: 04/12/2012 0900

8330 Nitroaromatics	and	Nitramines	(HPLC)
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Analysis Method: 8330 Prep Method: Dilution:

Analysis Date:

Prep Date:

3535 1.0

Analysis Batch: 500-146545 Prep Batch:

500-146630

INST35-36 Instrument ID: Initial Weight/Volume: 770 mL Final Weight/Volume: 6.0 mL

Injection Volume: Result Type:

100 uL **PRIMARY**

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16	*	0.077	0.16
1.3.5-Trinitrobenzene	<0.16		0.039	0.16
1.3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2.4.6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2.6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4.6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2.6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31 ⁻
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Acceptance Limits	
I,2-Dinitrobenzene	120	erene ar rene property (Indiana en la rene en la rene en la rene en la rene en la rene en la rene en la rene e	70 - 130)

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Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID:

JP-L3-GWMW631-0412

Lab Sample ID:

500-45420-3

04/18/2012 0253

04/17/2012 0940

Client Matrix:

Water

Date Sampled: 04/11/2012 0940

Date Received: 04/12/2012 0900

8330 Nitroaromatics a	nd Nitramines	(HPLC)
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Analysis Method: 8330 Prep Method:

Analysis Date:

Prep Date:

Dilution:

3535 1.0

Analysis Batch: Prep Batch:

500-146545 500-146630 Instrument ID: Initial Weight/Volume: 770 mL

INST35-36

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

Result Type:

PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31	400,000,000	0.12	0.31
RDX	<0.16	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2.4-Dinitrotoluene	<0.31		0.032	0.31
2.6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2.6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Accepta	ance Limits
1,2-Dinitrobenzene	114		70 - 130)

cespala

Job Number: 500-45420-1

Client Sample ID:

JP-L3-GWMW630-0412

Lab Sample ID:

500-45420-4

Client Matrix:

Water

Date Sampled: 04/11/2012 1015

Date Received: 04/12/2012 0900

8330	Nitroaromatics	and N	itramines	(HPLC)
------	----------------	-------	-----------	-------	---

Ana	lysis	Met	hod:
Prer	Met	hod	•

8330 3535 Analysis Batch: 500-146545 Prep Batch:

500-146630

Instrument ID:

Initial Weight/Volume: 770 mL

INST35-36

Dilution: Analysis Date: 1.0 04/18/2012 0327 Final Weight/Volume: 6.0 mL Injection Volume:

100 uL

Prep Date:

04/17/2012 0940

Result Type:

PRIMARY

, , , , , , , , , , , , , , , , , , , ,				
Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	4.7 J		0.12	0.31
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	0.077 👅	J	0.035	0.31
4-Amino-2,6-dinitrotoluene	0.18 👅	J	0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Accepta	ance Limits
1,2-Dinitrobenzene	115		70 - 130)

cesp3/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID:

JP-L3-GWMW630-0412

Lab Sample ID:

500-45420-4

Client Matrix:

Water

Date Sampled: 04/11/2012 1015

Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

DL

Analysis Method: Prep Method:

Analysis Date:

8330 3535 10

Analysis Batch: 500-146545 Prep Batch:

Run Type:

500-146630

Instrument ID: Initial Weight/Volume:

INST35-36 770 mL

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

Result Type:

PRIMARY

Analyte

Prep Date:

04/19/2012 2103 04/17/2012 0940

Qualifier

MDL

RDX

Dilution:

Result (ug/L) 8.7

0.77

RL 1.6

cespish

Job Number: 500-45420-1

Client Sample ID:

JP-L3-GWMW999-0412

Lab Sample ID:

500-45420-5

Client Matrix:

Water

04/18/2012 0401

04/17/2012 0940

Date Sampled: 04/11/2012 1200

Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramin	es (HPL (:1
0330 Milioal Cilialics allu Milialilli	C2 (111 F/	•

Analysis Method: 8330 Prep Method:

Analysis Date:

Prep Date:

Dilution:

3535 1.0

Analysis Batch: Prep Batch:

500-146545 500-146630

Instrument ID:

Initial Weight/Volume: 770 mL

INST35-36

Final Weight/Volume: Injection Volume:

Result Type:

6.0 mL 100 uL **PRIMARY**

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	4.7	***************************************	0.12	0.31
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2.4.6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2.6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4.6-dinitrotoluene	0.072 🕏	J	0.035	0.31
4-Amino-2.6-dinitrotoluene	0.15 👅	J	0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Accepta	ınce Limits
1,2-Dinitrobenzene	117		70 - 130)

CRS/23/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID:

JP-L3-GWMW999-0412

Lab Sample ID:

500-45420-5

Client Matrix:

Water

Date Sampled: 04/11/2012 1200

Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:

8330

Analysis Batch: 500-146545

Instrument ID:

INST35-36

Prep Method:

3535

Prep Batch:

500-146630

Initial Weight/Volume: 770 mL

Dilution:

Final Weight/Volume:

6.0 mL

Analysis Date:

Prep Date:

10 04/19/2012 2137

Run Type:

DL

Injection Volume: Result Type:

100 uL

PRIMARY

Analyte

04/17/2012 0940

Result (ug/L)

Qualifier

MDL

RDX

8.7

0.77

RL 1.6

rsh3/r

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID:

JP-L3-GWMW410-0412

Lab Sample ID:

500-45420-6

Client Matrix:

Water

Date Sampled: 04/11/2012 1110

Date Received: 04/12/2012 0900

8330	Nitroaromatics	and	Nitramines	(HPLC)
------	-----------------------	-----	-------------------	--------

Analysis Method: 8330 Prep Method: 3535 Analysis Batch: 500-146545 Prep Batch:

Instrument ID:

INST35-36

Dilution:

1.0

500-146630

Initial Weight/Volume: 770 mL Final Weight/Volume:

6.0 mL

Analysis Date: Prep Date:

04/18/2012 0435 04/17/2012 0940 Injection Volume: Result Type:

100 uL PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
1MX	<0.31	······································	0.12	0.31
RDX	<0.16	*	0.077	0.16
.3,5-Trinitrobenzene	<0.16		0.039	0.16
,3-Dinitrobenzene	<0.16		0.033	0.16
Vitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
etryl	<0.39		0.065	0.39
2.4-Dinitrotoluene	<0.31		0.032	0.31
2.6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
l-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
-Nitrotoluene	<0.31	•	0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier		nce Limits
.2-Dinitropenzene	114		70 - 130	

orshist

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID:

JP-L3-GWMW412-0412

Lab Sample ID:

500-45420-7

Client Matrix:

Water

Date Sampled: 04/11/2012 1210

Date Received: 04/12/2012 0900

8330	Nitroaromatics	and Nitramines	(HPL	C)	

Analysis Method: 8330

Analysis Batch: 500-146545

Instrument ID:

INST35-36

Prep Method:

3535

Prep Batch:

Initial Weight/Volume: 770 mL

Dilution:

1.0

500-146630

Final Weight/Volume:

6.0 mL

Analysis Date:

04/18/2012 0509

Injection Volume:

100 uL

Prep Date:

04/17/2012 0940

Result Type:

PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
1,3,5-Trinitrobenzene	0.11 5	J	0.039	0.16
1.3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	0.24		0.032	0.16
2.4.6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2.4-Dinitrotoluene	<0.31		0.032	0.31
2.6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4.6-dinitrotoluene	0.89		0.035	0.31
4-Amino-2.6-dinitrotoluene	1.7		0.074	0.31
2-Nitrotoluene	< 0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Accepta	ance Limits
1,2-Dinitrobenzene	116	2000 C C C C C C C C C C C C C C C C C C	70 - 130)

CRSh3/R

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID:

JP-L3-GWMW412-0412

Lab Sample ID:

500-45420-7

Client Matrix:

Water

Date Sampled: 04/11/2012 1210

Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:

8330 3535 Analysis Batch:

500-146545

Instrument ID:

INST35-36

Prep Method:

Prep Batch:

500-146630

Initial Weight/Volume: Final Weight/Volume:

770 mL

Dilution: Analysis Date:

10

Run Type: 04/19/2012 2211

DL

Injection Volume:

6.0 mL

Result Type:

100 uL PRIMARY

Prep Date:

04/17/2012 0940

Result (ug/L)

Qualifier

MDL

RL

Analyte HMX

28 3

1.2

3.1

CRS/12/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID:

JP-L3-GWMW412-0412

Lab Sample ID:

500-45420-7

Client Matrix:

04/17/2012 0940

Water

Date Sampled: 04/11/2012 1210

Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: Prep Method:

8330 3535 Analysis Batch: Prep Batch:

500-146545 500-146630

Instrument ID:

INST35-36 Initial Weight/Volume: 770 mL

Dilution: Analysis Date:

100 04/19/2012 2245

Run Type:

DL2

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

Result Type:

PRIMARY

Analyte

Prep Date:

Result (ug/L)

Qualifier

MDL 7.7

RL

RDX

120

16

25/13/r

Job Number: 500-45420-1

Client Sample ID:

JP-L3-GWMW633-0412

Lab Sample ID:

500-45420-8

Client Matrix:

Water

Date Sampled: 04/11/2012 1305

Date Received: 04/12/2012 0900

Analysis Method: 8330 Prep Method:

Analysis Date:

Prep Date:

Dilution:

3535

1.0

Analysis Batch: Prep Batch:

500-146545 500-146630

Instrument ID:

INST35-36 Initial Weight/Volume: 770 mL

Final Weight/Volume: Injection Volume:

6.0 mL

It Type:

100 uL **PRIMARY**

04/18/2012 0617	Injectio
04/17/2012 0940	Result

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	2.0 3	***************************************	0.12	0.31
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2.4.6-Trinitrotoluene	<0.16		0.036	0.16
Tetrvl	<0.39		0.065	0.39
2.4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31

Acceptance Limits Surrogate %Rec Qualifier 1,2-Dinitrobenzene 114

70 - 130

askah

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID:

JP-L3-GWMW633-0412

Lab Sample ID:

500-45420-8

Client Matrix:

Water

Date Sampled: 04/11/2012 1305

Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: Prep Method:

8330 3535

10

Analysis Batch: 500-146545 Prep Batch:

500-146630

Instrument ID:

INST35-36 Initial Weight/Volume: 770 mL

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

PRIMARY

Analysis Date: Prep Date:

04/19/2012 2319 04/17/2012 0940 Run Type:

DL

Result Type:

Analyte RDX

Dilution:

Result (ug/L) 6.7

Qualifier

MDL 0.77

RL 1.6

orshill

Job Number: 500-45420-1

Client Sample ID:

JP-L3-SW777-0412

Lab Sample ID:

500-45420-9

Client Matrix:

Water

04/18/2012 0651

Date Sampled: 04/11/2012 1325

Date Received: 04/12/2012 0900

8330 Nitroaromatics	and Nitramines	(HPLC)
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Analysis Method: 8330 Prep Method:

Analysis Date:

Dilution:

3535 1.0

Analysis Batch: Prep Batch:

500-146545 500-146630

Instrument ID:

INST35-36 Initial Weight/Volume: 770 mL

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

Prep Date: 04/17/2012 094	0	Resu	ılt Type:	PRIMARY
Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31	***************************************	0.12	0.31
RDX	0.25	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2.6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Acce	otance Limits
1,2-Dinitrobenzene	. 129		70 - 1	30

aspala

Job Number: 500-45420-1

Client Sample ID:

JP-L1-GWMW174-0412

Lab Sample ID:

500-45420-10

04/18/2012 0725

Client Matrix:

Water

Date Sampled: 04/11/2012 1305

Date Received: 04/12/2012 0900

8330 Nitroaromatics an	d Nitramines	(HPL	C)
------------------------	--------------	------	----

Analysis Method: 8330 Prep Method:

Analysis Date:

Dilution:

3535 1.0

Analysis Batch: Prep Batch:

500-146545 500-146630

Instrument ID:

INST35-36 Initial Weight/Volume: 770 mL

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

Result Type:

PRIMARY

Prep Date: 04/17/2012 0940		Resu	It Type:	PRIMARY
Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31	***************************************	0.12	0.31
RDX	<0.16	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Accep	tance Limits
1,2-Dinitrobenzene	114		70 - 13	30

25/23/2

Job Number: 500-45420-1

Client Sample ID:

JP-L1-GWMWWES3-0412

Lab Sample ID:

500-45420-11

Client Matrix:

Water

04/18/2012 0759

Date Sampled: 04/11/2012 1600

Date Received: 04/12/2012 0900

8330	Nitroaron	natics	and	Nitrami	nes (HPLC)	,

Analysis Method: 8330 Prep Method:

Analysis Date:

Dilution:

3535 1.0

Analysis Batch: 500-146545 Prep Batch:

500-146630

Instrument ID: Initial Weight/Volume: 770 mL

INST35-36 6.0 mL

Final Weight/Volume: Injection Volume:

100 uL

Prep Date:	04/17/2012 0940	•	Resu	ult Type:	PRIMARY
Analyte		Result (ug/L)	Qualifier	MDL	RL
HMX		<0.31	***************************************	0.12	0.31
RDX		0.74	*	0.077	0.16
1,3,5-Trinitrobena	zene	0.20		0.039	0.16
1,3-Dinitrobenzer	ne	<0.16		0.033	0.16
Nitrobenzene		<0.16		0.032	0.16
2,4,6-Trinitrotolue	ene	1.2		0.036	0.16
Tetryl		<0.39		0.065	0.39
2,4-Dinitrotoluene	Э	<0.31		0.032	0.31
2,6-Dinitrotoluene	Э	<0.31		0.071	0.31
2-Amino-4,6-dinit	trotoluene	0.67		0.035	0.31
4-Amino-2,6-dinif	trotoluene	1.0		0.074	0.31
2-Nitrotoluene		<0.31		0.082	0.31
4-Nitrotoluene		<0.31		0.082	0.31
3-Nitrotoluene		<0.31		0.14	0.31
Surrogate		%Rec	Qualifier	*****************************	otance Limits
1,2-Dinitrobenzer	ne	117		70 - 1	30

25/23/2

Job Number: 500-45420-1

Client Sample ID:

JP-L1-GWMW173-0412

Lab Sample ID:

500-45420-12

Client Matrix:

Water

Date Sampled: 04/11/2012 1400

Date Received: 04/12/2012 0900

0330 Militratolitatics and Midalities (fifte)	8330 Nitroaromatics	and Nitramines	(HPLC)
---	---------------------	----------------	--------

Analysis Method: 8330 Prep Method:

Analysis Date:

Prep Date:

Dilution:

3535 1.0

Analysis Batch: Prep Batch:

500-146630

500-146545 Instrument ID:

Initial Weight/Volume: 770 mL Final Weight/Volume:

INST35-36 6.0 mL

Injection Volume:

100 uL

04/18/2012 0833 04/17/2012 0940

Result Type:

PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	1.4 5		0.12	0.31
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	4.8		0.035	0.31
4-Amino-2,6-dinitrotoluene	5.4		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Accepta	ance Limits
1,2-Dinitrobenzene	115		70 - 130)

025/13/12

Client: Toltest Inc.

Job Number: 500-45420-1

Client Sample ID:

JP-L1-GWMW173-0412

Lab Sample ID:

500-45420-12

Client Matrix:

Water

Date Sampled: 04/11/2012 1400

Date Received: 04/12/2012 0900

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: Prep Method:

8330 3535 Analysis Batch: Prep Batch:

500-146630

500-146545

Instrument ID:

INST35-36 Initial Weight/Volume: 770 mL

Dilution:

10

Final Weight/Volume: 6.0 mL

Analysis Date:

04/19/2012 2353

Run Type:

DL

Injection Volume:

100 uL

Prep Date:

04/17/2012 0940

Result Type:

PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
RDX	10	*	0.77	1.6
2.4.6-Trinitrotoluene	12		0.36	1.6

25/23/2

LDC #: 27595A40 VALIDATION COMPLETENESS WORKSHEET SDG #: 500-45420-1 Level III Laboratory: Test America, Inc.

Date: 5 | 15 | 12 |
Page: 1 of 1 |
Reviewer: 17 |
2nd Reviewer: 0

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Technical holding times	A	Sampling dates: 4 10 - 4 11 12
- 11	Initial calibration	A	1. RSD = 20%
III.	Calibration verification/ICV	ASW	1. D = 151. 1ev/cev
IV.	Blanks	A	, ·
V	Surrogate recovery	8w	
VI.	Matrix spike/Matrix spike duplicates	N	
VII.	Laboratory control samples	SW	LCS/D
VIII.	Target compound identification	N	,
IX.	Compound quantitation/RL/LOQ/LODs	SW W	
X	System Performance	N	
XI.	Overall assessment of data	<u> </u>	
XII.	Field duplicates	SW	FD=45
XIII.	Field blanks	l N	

Note:

A = Acceptable

N = Not provided/applicable

SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank EB = Equipment blank

Validated Samples: WATER

1	JP-L3-SW557-0412	11	JP-L2-GWMWWES3-0412	21	146630MB	31	
2	JP-L3-SW558-0412	12	JP-L3-GWMW173-0412	22		32	
3	JP-L3-GWMW63 / -0412	13	8-DL	23_		33	
4	JP-L3-GWMW63 3 -0412	14		24		34	
5	JP-L3-GWMW999-0412	15		25		35	
6	JP-L3-GWMW410-0412	16		26		36	
7	JP-L3-GWMW412-0412	17		27		37	
8	JP-L3-GWMW633-0412	18		28		38	
9	JP-L3-SW777-0412	19		29		39	
10	JP-L2-GWMW174-0412	20		30		40	

Notes:		

VALIDATION FINDINGS WORKSHEET

METHOD: GC HPLC

8310	(8330)	8151	8141	8141(Con't)	8021B
A. Acenaphthene	А. НМХ	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotoluene	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Famphur	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Phosmet	
O. Phenanthrene	O. Nitroglycerin		O. Chlorpyrifos	JJ. Tetrachlorvinphos	
P. Pyrene	Р.		P. Fenthion	KK. Demeton (total)	
Ċ	a		Q. Parathion-ethyl		
۳.			R. Trichlornate		
Š			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes:_

LDC # 27595 A40

VALIDATION FINDINDS WORKSHEET Surrogate Recovery

Page: \ of

Reviewer: A

METHOD: GC / HPLC

Are surrogates required by the method? Yes / or No
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

| Y N N/A | Were surrogates spiked into all samples and blanks? | Y N N/A | Did all surrogate recoveries (%R) meet the QC limits?

YN N/A

#	Sample ID	Detector/ Column		Surrogate							
\vdash	(x ost) <u>+</u>	SN		W		76K (Limits) ()	מחוותט		N 0 0 1		Qualifications
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┰	Surrogate Compound		Surrogate Compound	punodwo		Surrogate Compound		Surrogate Compound	punoduo		
+	Chlorobenzene (CBZ)	ŋ	Octacosane	ane	Σ	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	robenzene	>	Tetrachloro-m- xvlene
+	4-Bromofluorobenzene (BFB)	되	Ortho-Terphenyl	phenyl	z	Terphenyl-D14	-	3,4-Dinitrotoluene	oluene	M	1.7-binitement
+	a,a,a-Trifluorotoluene	-	Fluorobenzene (FBZ)	ane (FBZ)	0	Decachlorobiphenyl (DCB)	⊃	Tripentyltin	ffin		
+	Bromochlorobenene	1	n-Triacontane	ntane		1-methylnaphthalene	>	Tri-n-propyltin	vyltin		
+	1,4-Dichlorobutane	~	Hexacosane	sane	a	Dichlorophenyl Acetic Acid (DCAA)	≯	Tributyl Phosphate	sphate		
4	1.4-Diffuorobenzene (DFB).		Bromobenzene	uzene	ч	4-Nitrophenol	×	Triohenyl Phosphata	nenhata		

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VALIDATION FINDINGS WORKSHEET

Laboratory Control Samples (LCS)

Page: of Reviewer:_ 2nd Reviewer:

METHOD: GC / HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y) N N/A

Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y(N) N/A

Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level Who Only
Y N(N/A)
Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

- 11									
ĮĮ.	CS/CSD ID	Compound	%R	LCS %R (Limits)	LCSD %R (Limits)	SD imits)	RPD (Limits)	Associated Samples	Qualifications
3 }	4/60301CS/D-	A	9	(80-115)	101	(80-115)	()	ALL + 81.K	J/P 1/4
து	1041235-054/-055			()	:	<u> </u>	0		
1	500-146639/2A			()		())		
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Compound Quantitation and Reported CRQLs VALIDATION FINDINGS WORKSHEET

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rage:	Reviewer:	and Reviewer:

GC ZHPLC METHOD:

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Level IV/D Only

Y N AUA

Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Did the reported results for detected target compounds agree within 10.0% of the recalculated results? Did the percent difference of detected compounds between two columns./detectors <40%?

If no. please see findings bellow.

Qualifications	T/A oly.				→					
%D Between Two Columns/Detectors Limit (≤40%)	48 47.9	533	F.12 - EST	58.1	51.3					
Sample ID	7	→	5	-)	<u></u>					
Compound Name	ナ	H	1	Τ	Ð					
#										

Comments:

LDC#:	27595A40	
CDC#		

VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

Page: _(_	_of
Reviewer:	AA
2nd Reviewer:	ca-

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

Y N NA Y N NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentration (ug/L)		(≤25)	(ug/L)	Qualifications
Analyte	4	5	RPD	Difference	(Parent Only)
А	4.7	4.7	0		No Qual.
I	0.077	0.012		0,005 (limit:0.31)	
Н	0.18	0.15		0.03 (limit ≤0.31)	
В	8.7	8.7	0		
			. 15		

	Concentration (ug/L)	(≤25)	(ug/L)	Qualifications
Analyte		RPD	Difference	(Parent Only)
-				

LDC Validation Report #27605

(April 2012 Samples)



Laboratory Data Consultants, Inc.

7750 El Camino Real, Ste. 2L Carlsbad, CA 92009

Phone 760.634.0437

Web www.lab-data.com

Fax 760.634.0439

May 24, 2012

Toltest.

5201 Jewell Lane Poducah KY 42001

ATTN: Mr. Gary Reside

SUBJECT:

JOAAP-GW, Data Validation

Dear Mr. Reside,

Enclosed is the final validation report for the fractions listed below. This SDG was received on May 9, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27605:

SDG#

Fraction

500-45457-1

Dissolved Metals, Dissolved Sulfate, Explosives

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan(QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. Rev. 0 July 2009
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1, April 2009
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Project Manager/Chemist

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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

JOAAP-GW

Collection Date:

April 10, 2012

LDC Report Date:

May 14, 2012

Matrix:

Water

Parameters:

Dissolved Metals

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45457-1

Sample Identification

JP-L3-SW004-0412 JP-L3-SW004-0412MS JP-L3-SW004-0412MSD

JP-L3-SW004-0412DUP

Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B and 7470A for Dissolved Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

ICP-MS was not utilized in this SDG.

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No dissolved metal contaminants were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Calcium Copper Zinc	0.100 mg/L 0.00556 mg/L 0.00582 mg/L	All samples in SDG 500-45457-1

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
JP-L3-SW004-0412	Copper	0.018 mg/L	0.018U mg/L

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was not performed by the laboratory.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW

Dissolved Metals - Data Qualification Summary - SDG 500-45457-1

No Sample Data Qualified in this SDG

JOAAP-GW

Dissolved Metals - Laboratory Blank Data Qualification Summary - SDG 500-45457-1

SDG	Sample	Analyte	Modified Final Concentration	A or P
500-45457-1	JP-L3-SW004-0412	Copper	0.018U mg/L	Α

JOAAP-GW

Dissolved Metals - Field Blank Data Qualification Summary - SDG 500-45457-1

No Sample Data Qualified in this SDG

1A-IN INORGANIC ANALYSIS DATA SHEET METALS - DISSOLVED

Client Sample ID: JP-L3-SW004-0412	Lab Sample ID: 500-45457-1	_
Lab Name: TestAmerica Chicago	Job No.: 500-45457-1	_
SDG ID.:		_
Matrix: Water	Date Sampled: 04/10/2012 15:45	
Reporting Basis: WET	Date Received: 04/14/2012 07:00	

						T	7	T	
CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method
7429-90-5	Aluminum	<0.20	0.20	0.025	mg/L			1	6010B
7440-36-0	Antimony	<0.020	0.020	0.0026	mg/L			1	6010B
7440-38-2	Arsenic	<0.010	0.010	0.0024	mg/L			1	6010B
7440-39-3	Barium	0.039	0.010	0.00044	mg/L			1	6010B
7440-41-7	Beryllium	<0.0040	0.0040	0.00044	mg/L			1	6010B
7440-43-9	Cadmium	0.00090	0.0020	0.00054	mg/L	J		1	6010B
7440-70-2	Calcium	73	0.20	0.087	mg/L		В	1	6010B
7440-47-3	Chromium	<0.010	0.010	0.00096	mg/L			1	6010B
7440-48-4	Cobalt	<0.0050	0.0050	0.0010	mg/L			1	6010B
7440-50-8	Copper	0.018	0.010	0.0011	mg/L		В	1	6010B
7439-89-6	Iron	<0.20	0.20	0.070	mg/L			1	6010B
7439-92-1	Lead	<0.0050	0.0050	0.0016	mg/L			1	6010B
7439~95-4	Magnesium	38	0.10	0.024	mg/L			1	6010B
7439-96-5	Manganese	0.090	0.010	0.0011	mg/L			1	6010B
7440-02-0	Nickel	<0.010	0.010	0.0019	mg/L			1	6010B
7440-09-7	Potassium	1.4	0.50	0.070	mg/L			1	6010B
7782-49-2	Selenium	<0.010	0.010	0.0027	mg/L			1	6010B
7440-22-4	Silver	<0.0050	0.0050	0.0011	mg/L			1	6010B
7440-23-5	Sodium	15	1.0	0.12	mg/L			1	6010B
7440-28-0	Thallium	<0.010	0.010	0.0013	mg/L			1	6010B
7440-62-2	Vanadium	<0.0050	0.0050	0.00062	mg/L			1	6010B
7440-66-6	Zinc	<0.020	0.020	0.0047	mg/L			1	6010B
7439-97-6	Mercury	<0.20	0.20	0.070	ug/L	1		1	7470A

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	•					•			Reviewer: MG 2nd Reviewer:
METH	IOD: Dissolved Metals (EP	A SW	/ 846 Met	thod 6010	B/7 000)	74	70A		
		eview	ed for ead	ch of the f	ollowing	valid	lation areas. Va	alidation find	dings are noted in attached
valida	tion findings worksheets.								
	Validation A								
ı.	Technical holding times	Α	Sampling dates: 4-10-12						
11.	ICP/MS Tune						tilized	· · · · · · · · · · · · · · · · · · ·	
111.	Calibration			N A	100		1111260		
IV.	Blanks			SW					
- V. V.	ICP Interference Check Sample	ہ (ارہ	Analysis	A					
VI.		e (ICS)	Allalysis	A	MS	/ M	(S)		
VII.		Matrix Spike Analysis			DU	•			
	Duplicate Sample Analysis			A	LC				
VIII.	Laboratory Control Samples (LCS)			7			utilized		
IX.	Internal Standard (ICP-MS)			27	No	t'	"		
X	Furnace Atomic Absorption QC			A	 ``				
XI.		ICP Serial Dilution							
XII.		Sample Result Verification			 				
XIII.	Overall Assessment of Data			A					
XIV.	Field Duplicates			N	1				
XV	Field Blanks			<u> </u>			· · · · · · · · · · · · · · · · · · ·		
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet		R = Rin	o compound sate eld blank	ls detected	i	D = Duplicate TB = Trip blar EB = Equipme		
Validat	ed Samples: water								
1	JP-L3-SW004-0412	11				21		31	
2	JP-L3-SW004-0412MS	12				22		32	
3	JP-L3-SW004-0412MSD	13				23		33	
4	JP-L3-SW004-0412DUP	14				24		34	
5		15				25		35	j
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Notes:_

PBW

LDC#: <u>276</u>05A4

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page:_	<u> of </u>
Reviewer:	MG
2nd reviewer:	

All circled elements are applicable to each sample.

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		Towns Annalus Line (TAL)
Sample ID	Matrix	Target Analyte List (TAL)
1	W	(Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co. Cu. Fe. Pb. Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn) Mo, B, Si, CN ⁻ ,
OC 2-74		(Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn), Hg (Ni, K, Se, Ag, Na, Tl, V, Zn) Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Analysis Method
ICP	W	(Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn) Hg, Ni, K, Se, Ag, Na, Tl, V, Zn), Mo, B, Si, CN ⁻ ,
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
GEAA		Al Sh As Ba Be Cd Ca Cr Co Cu Fe Pb Mg Mn Hg Ni K Se Ag Na Tl V Zn Mo B Si CN

Comments:_	Mercury by CVAA if performed	_
		-

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000) Sample Concentration units, unless otherwise noted: mg/L SDG #: See Cover LDC #: 27605A4

VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

Page: of

Reviewer:_ 2nd Reviewer:_

> Soil preparation factor applied: NA <u>=</u>

Associated Samples:

:			
-		0.018	
Action Limit	0.5000	0.0278	0.0291
Maximum ICB/CCB ^a (ug/L)			
Maximum PB ^a (mg/L)	0.100	0.00556	0.00582
te Maximum Maximum N PB³ PB³ I (mg/Kg) (mg/L)			
Analyte	Ca	Cu	Zn

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

JOAAP-GW

Collection Date:

April 12 through April 13, 2012

LDC Report Date:

May 16, 2012

Matrix:

Water

Parameters:

Dissolved Sulfate

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45457-1

Sample Identification

JP-M1-GWMW648-0412

JP-M1-GWMW998-0412

JP-M1-GWMW641-0412

JP-M1-GWMW997-0412

JP-M1-GWMW642-0412

JP-M1-GWMW640-0412

JP-M1-GWMW107-0412

JP-M1-GWMW231-0412

JP-M1-GWMW645-0412

JP-M1-GWMW646

JP-M1-GWMW649

JP-M1-GWMW644

JP-M1-GWMW643

JP-M1-SW709

JP-M1-GWMW641-0412MS

JP-M1-GWMW641-0412MSD

Introduction

This data review covers 16 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Dissolved Sulfate.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Calibration Verification

Calibration verification frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples JP-M1-GWMW998-0412 and JP-M1-GWMW641-0412 and samples JP-M1-GWMW997-0412 and JP-M1-GWMW642-0412 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concentra	tion (mg/L)				
Analyte	JP-M1-GWMW998-0412	JP-M1-GWMW641-0412	RPD (Limits)	Difference (Limits)	Flags	A or P
Sulfate	640	640	0 (≤25)	-	-	-

	Concentra	tion (mg/L)					
Analyte	JP-M1-GWMW997-0412	JP-M1-GWMW642-0412	RPD (Limits)	Difference (Limits)	Flags	A or P	
Sulfate	420	420	0 (≤25)	-	-	-	

JOAAP-GW

Dissolved Sulfate - Data Qualification Summary - SDG 500-45457-1

No Sample Data Qualified in this SDG

JOAAP-GW

Dissolved Sulfate - Laboratory Blank Data Qualification Summary - SDG 500-45457-1

No Sample Data Qualified in this SDG

JOAAP-GW

Dissolved Sulfate - Field Blank Data Qualification Summary - SDG 500-45457-1

No Sample Data Qualified in this SDG

Client Sample	ID: JP-M1-GWMW648-04		Lab Sample ID: 500-45457-3							
Lab Name: Te	estAmerica Chicago			Job No.: 500-45457-1						
SDG ID.:				mean tar						
Matrix: Wate	r		Date Sampl	.ed: 04/12	/2012	11:40		41-311-4-4		
Reporting Bas	is: WET			Date Recei	.ved: 04/1	.4/2012	07:00			
CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method	
14808-79-8	Sulfate	34	1.0	0.45	mg/L	<u> </u>	<u> </u>	5	300.0	

aspila

Client Sample	ID: JP-M1-GWMW998-04		Lab Sample	ID: 500-	45457-4				
Lab Name: Te	estAmerica Chicago			Job No.:	500-45457-	1			
SDG ID.:									
Matrix: Wate	r			Date Sampl	.ed: 04/12	/2012	12:00		
Reporting Bas	is: WET			Date Recei	ved: 04/1	4/2012	07:00		
CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method
14808-79-8	Sulfate	640	20	9.0	mg/L			100	300.0

aspula

Lab Sample ID: 500-45457-5 Client Sample ID: JP-M1-GWMW641-0412 Job No.: 500-45457-1 Lab Name: TestAmerica Chicago SDG ID.: Date Sampled: 04/12/2012 12:25 Matrix: Water Date Received: 04/14/2012 07:00 Reporting Basis: WET MDL Units Method RLResult CAS No. Analyte 100 | 300.0 9.0 mg/L 640 20 Sulfate 14808-79-8

or shill

Lab Sample ID: 500-45457-6 Client Sample ID: JP-M1-GWMW997-0412 Job No.: 500-45457-1 Lab Name: TestAmerica Chicago SDG ID.: Date Sampled: 04/12/2012 12:45 Matrix: Water Date Received: 04/14/2012 07:00 Reporting Basis: WET Units С Q DIL Method MDL RLCAS No. Analyte Result 50 300.0

10

4.5 mg/L

420

cestuliz

14808-79-8

Sulfate

Client Sample	ID: JP-M1-GWMW642-0		Lab Sample	ID: 500-	45457-7					
Lab Name: Te	estAmerica Chicago			Job No.: 500-45457-1						
SDG ID.:										
Matrix: Water				Date Sampl	.ed: 04/12	/2012	12:58			
Reporting Bas	is: WET			Date Recei	ved: 04/1	.4/2012	07:00			
CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method	
14808-79-8	Sulfate	420	10	4.5	mg/L		T	50	300.0	

aspla

Client Sample	e ID: JP-M1-GWMW640-0	112		Lab Sample	D: 500-	45457-8		·	
Lab Name: To	estAmerica Chicago			Job No.: 500-45457-1					
SDG ID.:							*		
Matrix: Wate	r			Date Sampl	.ed: 04/12	/2012	13:40		
Reporting Bas	sis: WET			Date Recei	lved: 04/1	14/2012	07:00		
CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method
14808-79-8	Sulfate	5200	200	90	mg/L	<u> </u>	<u> </u>	1000	300.0

aship

Client Sample	ID: JP-M1-GWMW107-04	12		Lab Sample	ID: 500-	45457-9					
Lab Name: Te	estAmerica Chicago			Job No.: 500-45457-1							
SDG ID.:				<u> </u>					·		
Matrix: Wate	trix: Water				Date Sampled: 04/12/2012 14:25						
Reporting Bas	is: WET			Date Recei	.ved: 04/1	.4/2012	07:00				
CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method		
14808-79-8	Sulfate	26000	1000	450	mg/L	<u> </u>		5000	300.0		

askula

Client Sample	ID: JP-M1-GWMW231-0	112		Lab Sample	ID: 500-	45457-1	0				
Lab Name: Te	estAmerica Chicago			Job No.:	500-45457-	-45457-1					
SDG ID.:											
Matrix: Wate	r			Date Sampl	ed: 04/12	/2012	15:20				
Reporting Bas	is: WET			Date Recei	.ved: 04/1	14/2012	07:00				
CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method		
14808-79-8	Sulfate	35000	1000	450	mg/L			5000	300.0		

askuliz

Client Sample	ID: JP-M1-GWMW645-04		Lab Sample	ID: 500-	-45457-1	1				
Lab Name: Te	stAmerica Chicago			Job No.: 500-45457-1						
SDG ID.:										
Matrix: Wate	r			Date Sampl	ed: 04/13	/2012	10:10			
Reporting Bas	is: WET			Date Recei	ved: 04/2	14/2012	07:00			
CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method	
14808-79-8	Sulfate	67	4.0	1.8	mg/L			20	300.0	

aspula

Lab Sample ID: 500-45457-12 Client Sample ID: JP-M1-GWMW646 Job No.: 500-45457-1 Lab Name: TestAmerica Chicago SDG ID.: Date Sampled: 04/13/2012 10:50 Matrix: Water Date Received: 04/14/2012 07:00 Reporting Basis: WET Q DIL Method Units С MDL RLCAS No. Analyte Result 50 | 300.0 10 4.5 mg/L 110

OR S/W/2

14808-79-8

Sulfate

Client Sample	ID: JP-M1-GWMW649		Lab Sample ID: 500-45457-13							
Lab Name: Te	estAmerica Chicago			Job No.: 500-45457-1						
SDG ID.:									····	
Matrix: Wate	r		-	Date Sampl	ed: 04/13	/2012	11:40			
Reporting Bas	is: WET			Date Recei	.ved: 04/1	14/2012	07:00			
CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method	
14808-79-8	Sulfate	64	4.0	1.8	mg/L			20	300.0	

or spala

Lab Sample ID: 500-45457-14 Client Sample ID: JP-M1-GWMW644 Job No.: 500-45457-1 Lab Name: TestAmerica Chicago SDG ID.: Date Sampled: 04/13/2012 10:04 Matrix: Water Date Received: 04/14/2012 07:00 Reporting Basis: WET Units С Q DIL Method MDL Result RLCAS No. Analyte

10

4.5 mg/L

160

aspula

50 300.0

14808-79-8

Sulfate

Lab Sample ID: 500-45457-15 Client Sample ID: JP-M1-GWMW643 Job No.: 500-45457-1 Lab Name: TestAmerica Chicago SDG ID.: Date Sampled: 04/13/2012 09:32 Matrix: Water Date Received: 04/14/2012 07:00 Reporting Basis: WET MDL Units С Q Method RL Result CAS No. Analyte 300.0 1.8 | mg/L 58 4.0 14808-79-8 Sulfate

aspla

Client Sample	: ID: JP-M1-SW709		Lab Sample	D: 500-	500-45457-19					
Lab Name: Te	estAmerica Chicago			Job No.: 500-45457-1						
SDG ID.:										
Matrix: Wate	atrix: Water				.ed: 04/13	3/2012	10:10			
Reporting Bas	is: WET		-112.76.	Date Recei	ved: 04/	14/2012	07:00		LL CONTRACTOR OF THE CONTRACTO	
CAS No.	Analyte	Result	RL	MDL	Units	С	Q	DIL	Method	
14808-79-8	Sulfate	60	4.0	1.8	mg/L	<u> </u>		20	300.0	

æs/u/r

	Validation	Area			<u> </u>			Cor	nments	
I.	Technical holding times			Α	Sampli	ing d	ates: 4-1	2-12	through	4-13-12
11	Initial calibration			Α					V	
III.	Calibration verification			Α						
IV	Blanks			A						
٧	Matrix Spike/Matrix Spike D	uplicat	es	A	MS,	/M	۲S			
VI.	Duplicates			7						
VII.	Laboratory control samples			Α	LC	S				
√III.	Sample result verification			N						
IX.	Overall assessment of data	l		A						
Χ.	Field duplicates			SW	17,	3),(4,6)		
χı	Field blanks			7			/ / / /			
te: lidated	A = Acceptable N = Not provided/applicable SW = See worksheet Samples: Q 11 Water	е	R = Rin	o compounds sate eld blank	s detect	ed		plicate rip blank quipment	blank	
ال	P-M1-GWMW648-0412	11	JP-M1-GWM	W649	2	21			31	
	P-M1-GWMW998-0412	12	JP-M1-GWM			22			32	
-1	P-M1-GWMW641-0412	13	JP-M1-GWM			23			33	
	P-M1-GWMW997-0412	14	JP-M1-SW70		2	24			34	
ال ا	P-M1-GWMW642-0412	15 (JP-M1-GWM	W641-0412N	AS 2	25			35	
	P-M1-GWMW640-0412	† .	JP-M1-GWM			26			36	
J	P-M1-GWMW107-0412	17				27			37	
	P-M1-GWMW231-0412	18				28			38	
	P-M1-GWMW645-0412	19				29 1	PBWI		39	
	P-M1-GWMW646	20				302	PBW2		40	

Level III

Date: 5-11-12

Page: [of [Reviewer: MG

2nd Reviewer: 1

LDC #: 27605A6 VALIDATION COMPLETENESS WORKSHEET

SDG #: 500-45457-1

Laboratory: Test America, Inc.

LDC#: <u>07605</u>A6 **VALIDATION FINDINGS WORKSHEET**<u>Field Duplicates</u>

Page: __l of _l Reviewer: _ M(-, 2nd Reviewer: _ (2____

Inorganics, Method See Cover

Concentration (mg/L)					0	
Analyte	2	3	RPD (≤25)	Difference	Limits	Qualification (Parent only)
Sulfate	640	640	0			

V:\FIELD DUPLICATES\FD_inorganic\27605A6.wpd

Concentration (mg/L)						
Analyte	4	5	RPD (≤25)	Difference	Limits	Qualification (Parent only)
Sulfate	420	420	0			

V:\FIELD DUPLICATES\FD_inorganic\27605A6.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

JOAAP-GW

Collection Date:

April 12 through April 13, 2012

LDC Report Date:

May 22, 2012

Matrix:

Water

Parameters:

Explosives

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45457-1

Sample Identification

JP-L3-SW004-0412

JP-L1-GWMW131

JP-L1-GWWES1

JP-L1-SW550

JP-OA-GWMW118

JP-OA-GWMW119

JP-OA-GWMW117

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Column	Compound	%D	Associated Samples	Flag	A or P
4/18/12	UC5 ODS	2-Nitrotoluene	17.5	JP-OA-GWMW118 JP-OA-GWMW119 JP-OA-GWMW117	J (all detects) UJ (all non-detects)	А

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for sample JP-L1-GWMW131. Since the sample was diluted out, no data were qualified.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
LSC/D500-146630/2-A (All samples in SDG 500-45457-1)	НМХ	116 (80-115)	121 (80-115)	-	J (all detects)	Р

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation and RLs

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
JP-L1-GWMW131	1,3-Dinitrobenzene	130.0	J (all detects)	А
JP-L1-GWWES1	1,3,5-Trinitrobenzene 4-Amino-2,6-dinitrotoluene	189.8 63.5	J (all detects) J (all detects)	А

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW Explosives - Data Qualification Summary - SDG 500-45457-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45457-1	JP-OA-GWMW118 JP-OA-GWMW119 JP-OA-GWMW117	2-Nitrotoluene	J (all detects) UJ (all non-detects)	А	Continuing calibration (%D)
500-45457-1	JP-L3-SW004-0412 JP-L1-GWMW131 JP-L1-GWWES1 JP-L1-SW550 JP-OA-GWMW118 JP-OA-GWMW119 JP-OA-GWMW117	НМХ	J (all detects)	Р	Laboratory control samples (%R)
500-45457-1	JP-L1-GWMW131	1,3-Dinitrobenzene	J (all detects)	А	Compound quantitation and RLs (column difference)
500-45457-1	JP-L1-GWWES1	1,3,5-Trinitrobenzene 4-Amino-2,6-dinitrotoluene	J (all detects) J (all detects)	Α	Compound quantitation and RLs (column difference)

JOAAP-GW

Explosives - Laboratory Blank Data Qualification Summary - SDG 500-45457-1

No Sample Data Qualified in this SDG

JOAAP-GW

Explosives - Field Blank Data Qualification Summary - SDG 500-45457-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-45457-1

Client Sample ID:

JP-L3-SW004-0412

Lab Sample ID:

500-45457-2

Client Matrix:

Analysis Date:

Water

Date Sampled: 04/12/2012 1030

Date Received: 04/14/2012 0700

Analysis Method: Prep Method: Dilution:

8330 3535

1.0 04/18/2012 0907

04/17/2012 0940

Analysis Batch: Prep Batch:

500-146545 500-146630 Instrument ID:

INST35-36 Initial Weight/Volume: 770 mL Final Weight/Volume: 6.0 mL

Injection Volume: Result Type:

100 uL DDIMADV

Prep Date: 04/17/2012 0940		•	ılt Type:	PRIMARY
Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31	THE COLUMN TWO COLUMNS AND THE COLUMN TO THE COLUMN THE	0.12	0.31
RDX	<0.16	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Accept	ance Limits
1,2-Dinitrobenzene	111		70 - 13	10

astala

Client: Toltest Inc.

Job Number: 500-45457-1

Client Sample ID:

JP-L1-GWMW131

Lab Sample ID:

500-45457-16

04/18/2012 0941

Client Matrix:

Water

Date Sampled: 04/12/2012 1600

Date Received: 04/14/2012 0700

8330 Nitroaromatics	and	Nitramines	(HPLC)
---------------------	-----	-------------------	--------

Analysis Method: 8330 Prep Method: Dilution:

Analysis Date:

3535 10

Analysis Batch: Prep Batch:

500-146545 500-146630 Instrument ID:

INST35-36 Initial Weight/Volume: 770 mL

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

Prep Date:	04/17/2012 0940		•	ilit Type:	PRIMARY
Analyte		Result (ug/L)	Qualifier	MDL	RL
HMX		<3.1	CHARLES AND AND AND AND AND AND AND AND AND AND	1.2	3.1
RDX		<1.6	*	0.77	1.6
1,3,5-Trinitrober		<1.6		0.39	1.6
1,3-Dinitrobenze	ene	5.4		0.33	1.6
Nitrobenzene		<1.6		0.32	1.6
Tetryl		<3.9		0.65	3.9
2,4-Dinitrotoluer		<3.1		0.32	3.1
2,6-Dinitrotoluer		<3.1		0.71	3.1
2-Amino-4,6-din		65		0.35	3.1
4-Amino-2,6-din	itrotoluene	70		0.74	3.1
2-Nitrotoluene		<3.1		0.82	3.1
4-Nitrotoluene		<3.1		0.82	3.1
3-Nitrotoluene		<3.1		1.4	3.1
Surrogate		%Rec	Qualifier	Accepta	ance Limits
1,2-Dinitrobenze	ene	296	X	70 - 13	***************************************

astaliz

Client: Toltest Inc.

Job Number: 500-45457-1

Client Sample ID:

JP-L1-GWMW131

Lab Sample ID:

500-45457-16

Client Matrix:

Water

Date Sampled: 04/12/2012 1600

Date Received: 04/14/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: Prep Method:

8330 3535 Analysis Batch: Prep Batch:

500-146545 500-146630 Instrument ID:

INST35-36

Dilution:

500

•

500-146630

Initial Weight/Volume: Final Weight/Volume:

770 mL 6.0 mL

Analysis Date: Prep Date:

04/20/2012 0027

Run Type:

DL

Injection Volume:

100 uL

Analyte

04/17/2012 0940

Result Type:

PRIMARY

2,4,6-Trinitrotoluene

Result (ug/L) 2200 Qualifier

MDL 18 RL 80

Client: Toltest Inc.

Job Number: 500-45457-1

Client Sample ID:

JP-L1-GWWES1

Lab Sample ID:

500-45457-17

Client Matrix:

Water

Date Sampled: 04/12/2012 1422

Date Received: 04/14/2012 0700

8330 Nitroaromatics	and Nitramines	(HPLC)

Analysis Method: Prep Method:

8330 3535 Analysis Batch: Prep Batch:

500-146545 500-146630 Instrument ID: Initial Weight/Volume:

INST35-36 : 770 mL

Dilution: Analysis Date: 10

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

Prep Date:

04/18/2012 1049 04/17/2012 0940

Result Type:

PRIMARY

,		11000	м туро.	1 Tanana Tanana	
Analyte	Result (ug/L)	Qualifier	MDL	RL	
HMX	<3.1	1984 1884 1884 	1.2	3.1	Makeny
RDX	<1.6	*	0.77	1.6	
1,3,5-Trinitrobenzene	40 3		0.39	1.6	
1,3-Dinitrobenzene	<1.6		0.33	1.6	
Nitrobenzene	3.9		0.32	1.6	
2,4,6-Trinitrotoluene	38		0.36	1.6	
Tetryl	<3.9		0.65	3.9	
2,4-Dinitrotoluene	<3.1		0.32	3.1	
2,6-Dinitrotoluene	<3.1		0.71	3.1	
2-Amino-4,6-dinitrotoluene	13		0.35	3.1	
4-Amino-2,6-dinitrotoluene	21 🗲		0.74	3.1	
2-Nitrotoluene	<3.1		0.82	3.1	
4-Nitrotoluene	<3.1		0.82	3.1	
3-Nitrotoluene	<3.1		1.4	3.1	
Surrogate	%Rec	Qualifier	Acce	ptance Limits	
1,2-Dinitrobenzene	61	X	70 - 7	30	-90-0000

aspan

Client: Toltest Inc.

Job Number: 500-45457-1

Client Sample ID:

JP-L1-SW550

Lab Sample ID:

500-45457-18

04/18/2012 1123

Client Matrix:

Water

Date Sampled: 04/12/2012 1330 Date Received: 04/14/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: 8330 Prep Method: Dilution:

Analysis Date:

3535 1.0

Analysis Batch: 500-146545 Prep Batch:

500-146630

Instrument ID:

INST35-36 Initial Weight/Volume: 770 mL

Final Weight/Volume: 6.0 mL Injection Volume:

100 uL

Prep Date:	04/17/2012 0940		Resu	ılt Type:	PRIMARY
Analyte		Result (ug/L)	Qualifier	MDL	RL
HMX		<0.31	e de la companie de la confessión de la	0.12	0.31
RDX		<0.16	*	0.077	0.16
1,3,5-Trinitrobe	nzene	<0.16		0.039	0.16
1,3-Dinitrobenze	ene	<0.16		0.033	0.16
Nitrobenzene		<0.16		0.032	0.16
2,4,6-Trinitrotolu	uene	<0.16		0.036	0.16
Tetryl		<0.39		0.065	0.39
2,4-Dinitrotolue	ne	<0.31		0.032	0.31
2,6-Dinitrotolue	ne	<0.31		0.071	0.31
2-Amino-4,6-dir		<0.31		0.035	0.31
4-Amino-2,6-dir	itrotoluene	<0.31		0.074	0.31
2-Nitrotoluene		<0.31		0.082	0.31
4-Nitrotoluene		<0.31		0.082	0.31
3-Nitrotoluene		<0.31		0.14	0.31
Surrogate		%Rec	Qualifier	Accept	ance Limits
1,2-Dinitrobenze	ene	107		70 - 13	CONTENTION OF THE PROPERTY CONTENTS OF THE PROPERTY OF THE PRO

Client: Toltest Inc.

Job Number: 500-45457-1

Client Sample ID:

JP-OA-GWMW118

Lab Sample ID:

500-45457-20

Client Matrix:

Water

Date Sampled: 04/13/2012 1250

Date Received: 04/14/2012 0700

8330 Nitroaromatics and Nitramines (HPLC)	8330 Nitroaromatics	and	Nitramines	(HPLC)
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Analysis Method: 8330 Prep Method: 3535

Analysis Batch: 500-146545

Instrument ID:

INST35-36 Initial Weight/Volume: 770 mL

Dilution: 1.0 Analysis Date:

Prep Batch:

500-146630

Final Weight/Volume: Injection Volume:

6.0 mL

Prep Date:

04/18/2012 1231 04/17/2012 0940

Result Type:

100 uL PRIMARY

5 11 11 20 12 00 40		Resi	ait Type.	PRIMARY	
Analyte	Result (ug/L)	Qualifier	MDL	RL	
HMX	<0.31	**************************************	0.12	0.31	
RDX	<0.16	*	0.077	0.16	
1,3,5-Trinitrobenzene	<0.16		0.039	0.16	
1,3-Dinitrobenzene	<0.16		0.033	0.16	
Nitrobenzene	<0.16		0.032	0.16	
2,4,6-Trinitrotoluene	<0.16		0.036	0.16	
Tetryl	<0.39		0.065	0.39	
2,4-Dinitrotoluene	<0.31		0.032	0.31	
2,6-Dinitrotoluene	<0.31		0.071	0.31	
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31	
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31	
2-Nitrotoluene	<0.31 US		0.082	0.31	
4-Nitrotoluene	<0.31		0.082	0.31	
3-Nitrotoluene	<0.31		0.14	0.31	
Surrogate	%Rec	Qualifier	Accep	otance Limits	
1,2-Dinitrobenzene	112	ere en en en en en en en en en en en en en	70 - 1	30	

aspall

Client: Toltest Inc.

Job Number: 500-45457-1

Client Sample ID:

1,2-Dinitrobenzene

JP-OA-GWMW119

Lab Sample ID:

500-45457-21

Client Matrix:

Water

Date Sampled: 04/13/2012 1250 Date Received: 04/14/2012 0700

Analysis Method: 8330 Prep Method: 3535 Dilution: 1.0

Analysis Batch: Prep Batch:

500-146545 500-146630 Instrument ID:

INST35-36 Initial Weight/Volume: 770 mL

Analysis Date: 04/18/2012 1305 Prep Date: 04/17/2012 0940

Injection Volume: Result Type:

Final Weight/Volume:

70 - 130

6.0 mL 100 uL **PRIMARY**

Analyte	Result (ug/L)	Qualifier	MDL	RL	
HMX	<0.31	arrana da anticipa de de la compansa	0.12	0.31	and the second second
RDX	<0.16	*	0.077	0.16	
1,3,5-Trinitrobenzene	<0.16		0.039	0.16	
1,3-Dinitrobenzene	<0.16		0.033	0.16	
Nitrobenzene	<0.16		0.032	0.16	
2,4,6-Trinitrotoluene	<0.16		0.036	0.16	
Tetryl	<0.39		0.065	0.39	
2,4-Dinitrotoluene	<0.31		0.032	0.31	
2,6-Dinitrotoluene	<0.31		0.071	0.31	
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31	
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31	
2-Nitrotoluene	<0.31		0.082	0.31	
4-Nitrotoluene	<0.31		0.082	0.31	
3-Nitrotoluene	<0.31		0.14	0.31	
Surrogate	%Rec	Qualifier	Accepta	ince Limits	

110

aspala

Client: Toltest Inc. Job Number: 500-45457-1

Client Sample ID:

JP-OA-GWMW117

Lab Sample ID:

500-45457-22

Client Matrix:

Water

Date Sampled: 04/13/2012 1200

Date Received: 04/14/2012 0700

Analysis Method: 8330 Prep Method: 3535

Analysis Batch: Prep Batch:

500-146545

Instrument ID:

INST35-36 Initial Weight/Volume: 770 mL

Dilution:

1.0

500-146630

Final Weight/Volume: 6.0 mL

Analysis Date: Prep Date:

04/18/2012 1339

Injection Volume:

100 uL

Result Type:

PRIMARY

Prep Date: 04/17/2012 0940		•	Ilt Type:	PRIMARY
Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31	erroren errore	0.12	0.31
RDX	<0.16	*	0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16	•	0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31	4	0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31 UD		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Accept	ance Limits
1,2-Dinitrobenzene	119		70 - 13	0

		-1-1
LDC #: <u>27605A40</u>	VALIDATION COMPLETENESS WORKSHEET	Date: 5 15 12
SDG #: <u>500-45457-1</u>	_ Level III	Page: (of)
Laboratory: Test America, Inc.	_	Reviewer: A
		2nd Reviewer: ()
METHOD: HPLC Explosives (EPA SW 846 Method 8330)	

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 4/2-4/3/12
11	Initial calibration	I A	1. RSD = 201.
111.	Calibration verification/ICV	sw	1. D = 15%, revicer
IV.	Blanks	A	''
V	Surrogate recovery	SW	
VI.	Matrix spike/Matrix spike duplicates	N	
VII.	Laboratory control samples	SW	LCS/D
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	SWN	
<u>X.</u>	System Performance	N	
XI.	Overall assessment of data	A	
XII.	Field duplicates	N	
XIII.	Field blanks	LN	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate

TB = Trip blank
EB = Equipment blank

WATER Validated Samples:

1	JP-L3-SW004-0412	11	146630 MB	21	31	
2	JP-L1-GWMW131	12	(10030 018	22	 32	
^	JP-L1-GWWES1	13		23	33	
4	JP-L1-SW550	14		24	34	
5	JP-OA-GWMW118	15		25	 35	
6	JP-OA-GWMW119	16		26	 36	
7	JP-OA-GWMW117	17		27	37	
8		18		28	38	
9		19		29	39	
10		20		30	40	

Notes:				

VALIDATION FINDINGS WORKSHEET

METHOD: GC / HPLC

8310	(8330)	8151	8141	8141(con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryi	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	1. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotoluene	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Famphur	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Phosmet	
O. Phenanthrene	O. Nitroglycerin		O. Chlorpyrifos	JJ. Tetrachlorvinphos	
P. Pyrene	P.		P. Fenthion	KK. Demeton (total)	
Ċ	Q		Q. Parathion-ethyl		
a '			R. Trichlornate		
ý			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes:

LDC # 27605 A40

VALIDATION FINDINGS WORKSHEET **Continuing Calibration**

Page: of Reviewer: # 2nd Reviewer: 4

METHOD: __GC__HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N N/A Level IV Only

Were the retention times for all calibrated compounds within their respective acceptance windows?

				Π																T		Ī
Qualifications	1/W1/A																					
Associated Samples	5-7																					
RT (limit)	()	((.)	()	•	()	(.)	(()	())	(()))	(())
%D≤(5/. (Limit <-20.0)	17.5																					
Compound																						
Detector/ Columb	ucstobs																					,
Standard ID	10+0-44-040 e1814		•																			
Date	ताश्राप्त	-			<u> </u>																	
##																						

LDC # 27605A-10

VALIDATION FINDINDS WORKSHEET Surrogate Recovery

Reviewer: 2nd Reviewer: 4

Page:

METHOD: GC HPLC

Are surrogates required by the method? Yes / or No Please see qualifications are identified as "N/A". N N/A

Were surrogates spiked into all samples and blanks?
Did all surrogate recoveries (%R) meet the QC limits?

	Sample ID	Dete Col	Detector/ Column	Surrogate Compound		%R (Limits)			ė	
\dashv	2 (lox)	14	Monspor				84-178	48 1 No Que		granical Oliv
	A	1	7	\	-	5.40	+			
\vdash	(xoas) t	1	ALS UCSWODS	7	-	0 -04	1			
-					_))		
					$\frac{1}{1}$			(
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-					\bot			()		
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⊣⊩)		(
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∦-					4		ì)		
								(
					-)				
					_)				
╌╢	Surrogate Compound		Surroga	Surrogate Compound		Surrogate Compound		Surrogate Compound		
	Chlorobenzene (CBZ)	5	8	Octacosane	≥	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	٨	Tetrachloro-m- xylene
+	4-Bromofluorobenzene (BFB)	I	Dut.	Ortho-Terphenyi	z	Terphenyl-D14	⊢	3,4-Dinitrotoluene	М	(,2-hiniteospendent
+	a,a,a-Trifluorotoluene	-	Fluoro	Fluorobenzene (FBZ)	0	Decachlorobiphenyl (DCB)	n	Tripentyltin		
-+-	Bromochlorobenene	7	<u>i-u</u>	n-Triacontane	α	1-methylnaphthalene	>	Tri-n-propyltin		
-1-	1,4-Dichlorobutane	ㅗ	Í	Hexacosane	σ	Dichlorophenyl Acetic Acid (DCAA)	8	Tributyl Phosphate		
-1	1,4-Difluorobenzene (DFB).	1	Bro	Bromobenzene	Я	4-Nitrophenol	×	Triphenyl Phosphate		

LDC #. 27405 AND

VALIDATION FINDINGS WORKSHEET Laboratory Control Samples (LCS)

Page:__ Reviewer: 2nd Reviewer:

METHOD: __ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG? Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

X N/A N/A N/A

Level JAHB Only Y N N/A

Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

	Т	Ī		Т		i		Ξ'n		Ī														\Box
Qualifications	1/P clets.														•									
Associated Samples	ALL + BLK																							
RPD (Limits)	()	()	()	()	()	()	()		()	()	()	()	()	()	()	(()	()	()	()	()	()	()	()
LCSD %R (Limits)	(21 (80-1KT)	()	()	()	()	()	()		()	()	()	()	()	()	()		()	()	()	()	()	()	()	
LCS %R (Limits)	(SIF08) All		()	()	()	()	()		()	(()	()	()	()	()	()	()	()	()	()	()	()	()	()
Compound	¥		4																					
rcs/rcsd id	0.104(2.35-21/VOLY	168984-025 507	45/																					
#																								

5	
1500	
276	•
#:	4
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Compound Quantitation and Reported CRQLs VALIDATION FINDINGS WORKSHEET

	#)
Page:	Reviewer:	2nd Reviewer:

GC / HPLC METHOD:

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Level IX(D Only

Y N(M/A

Y N N/A

≸zz×

Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Did the reported results for detected target compounds agree within 10.0% of the recalculated results? Did the percent difference of detected compounds between two columns./detectors <40%?

If no, please see findings bellow.

J/A det.				•											
(30, 1		140 189.8	Cart 63.5												
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Comments:

LDC Validation Report #27649

(April 2012 Samples)



Laboratory Data Consultants, Inc.

7750 El Camino Real, Ste. 2L Carlsbad, CA 92009

Phone 760.634.0437

Web www.lab-data.com

Fax 760.634.0439

Toltest.

May 31, 2012

5201 Jewell Lane Poducah KY 42001 ATTN: Mr. Gary Reside

SUBJECT:

JOAAP-GW. Data Validation

Dear Mr. Reside.

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on May 15, 2012. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 27649:

SDG#	<u>Fraction</u>
500-45518-1 500-45519-1 500-45521-1	Volatiles, Semivolatiles, Dissolved Metals, Wet Chemistry, Explosives

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan(QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. Rev. 0 July 2009
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1, April 2009
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Project Manager/Chemist

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Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

JOAAP-GW

Collection Date:

April 16, 2012

LDC Report Date:

May 24, 2012

Matrix:

Water

Parameters:

Volatiles

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45518-1

Sample Identification

JP-M13-GWMW808

JP-M13-GWMW126R

JP-M13-GWMW362

JP-M13-GWMW999

JP-M13-GWMW809

JP-M13-GWMW806

JP-M13-GWMW807

JP-M13-GWMW126RMS

JP-M13-GWMW126RMSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds.

The percent difference (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
4/20/12	Isopropylbenzene	20.4	All samples in SDG 500-45518-1	J (all detects) UJ (all non-detects)	А

All of the continuing calibration relative response factors (RRF) for were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples JP-M13-GWMW362 and JP-M13-GWMW999 were identified as field duplicates. No volatiles were detected in any of the samples.

JOAAP-GW Volatiles - Data Qualification Summary - SDG 500-45518-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45518-1	JP-M13-GWMW808 JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW809 JP-M13-GWMW806 JP-M13-GWMW807	Isopropylbenzene	J (all detects) UJ (all non-detects)	А	Continuing calibration (ICV %D)

JOAAP-GW

Volatiles - Laboratory Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

JOAAP-GW

Volatiles - Field Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW808

Lab Sample ID:

500-45518-1

Client Matrix:

Water

Date Sampled: 04/16/2012 1405 Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B

Analysis Batch:

500-147778

Instrument ID:

CMS19

Prep Method: Dilution:

5030B

Prep Batch:

N/A

Lab File ID:

45518-01.D

1.0

Initial Weight/Volume: 5 mL

Analysis Date: Prep Date:

04/27/2012 0151 04/27/2012 0151

Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochioromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0 VS		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0 <5.0		0.79	5.0
	٦٥.0		0.70	0.0

TestAmerica Chicago

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Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW808

Lab Sample ID:

500-45518-1

Client Matrix:

Water

Date Sampled: 04/16/2012 1405

Date Received: 04/17/2012 1230

8260B VOC

Analysis Method:

8260B

Analysis Batch:

500-147778

Instrument ID:

CMS19

Prep Method:

5030B

Prep Batch:

N/A

Lab File ID: Initial Weight/Volume:

45518-01.D

Dilution: Analysis Date: 1.0

04/27/2012 0151

Prep Date:

04/27/2012 0151

Final Weight/Volume:

5 mL

5 mL

Result (ug/L) Qualifier MDL RL Analyte 0.28 1.0 Methyl tert-butyl ether <1.0 Naphthalene <1.0 0.24 1.0 N-Propylbenzene <1.0 0.19 1.0 Styrene <1.0 0.26 1.0 1,1,1,2-Tetrachloroethane <1.0 0.31 1.0 1,1,2,2-Tetrachloroethane <1.0 0.35 1.0 0.22 Tetrachloroethene <1.0 1.0 <1.0 0.15 1.0 Toluene 1.2.3-Trichlorobenzene <1.0 0.36 1.0 1,2,4-Trichlorobenzene <1.0 0.22 1.0 1,1,1-Trichloroethane <1.0 0.26 1.0 1,1,2-Trichloroethane <1.0 0.30 1.0 Trichloroethene <1.0 0.18 1.0 Trichlorofluoromethane <1.0 0.22 1.0 1,2,3-Trichloropropane <1.2 0.60 1.2 1,2,4-Trimethylbenzene <1.0 0.22 1.0 1,3,5-Trimethylbenzene <1.0 0.23 1.0 Vinyl chloride <1.0 0.13 1.0 o-Xylene <1.0 0.13 1.0 m&p-Xylene 2.0 <2.0 0.30 Xylenes, Total <1.0 0.30 1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	91		75 - 120
Dibromofluoromethane	92		85 - 115
1,2-Dichloroethane-d4 (Surr)	95		70 - 120
Toluene-d8 (Surr)	99		85 - 120

Job Number: 500-45518-1 Client: Toltest Inc.

Client Sample ID: JP-M13-GWMW126R

Lab Sample ID: 500-45518-2

Date Sampled: 04/16/2012 1525 Date Received: 04/17/2012 1230 Client Matrix: Water

8260B VOC

Analysis Method: Prep Method:

8260B 5030B Analysis Batch: 500-147778

Instrument ID:

CMS19

Dilution:

1.0

Prep Batch:

N/A

45518-02.D

Lab File ID:

Initial Weight/Volume: 5 mL

Analysis Date:

04/27/2012 0214

Final Weight/Volume: 5 mL

Prep Date:	04/2//2012	0214

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0 گ		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0
				:

TestAmerica Chicago

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05/08/2012

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW126R

Lab Sample ID:

500-45518-2

Client Matrix:

Water

Date Sampled: 04/16/2012 1525

Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B

Analysis Batch:

500-147778

Instrument ID:

CMS19

Prep Method:

5030B

Prep Batch:

Lab File ID:

45518-02.D

Dilution:

1.0

N/A

Initial Weight/Volume: 5 mL

Analysis Date:

04/27/2012 0214

	•		
inal	Weight/Volume:	5	r

85 - 120

mL

Prep Date:	

04/27/2012 0	214
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Analyte	Result (ug/L)	Qualifier	MDL	RL	
Methyl tert-butyl ether	<1.0	***************************************	0.28	1.0	
Naphthalene	<1.0		0.24	1.0	
N-Propylbenzene	<1.0		0.19	1.0	
Styrene	<1.0		0.26	1.0	
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0	
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0	
Tetrachloroethene	<1.0		0.22	1.0	
Toluene	<1.0		0.15	1.0	
1,2,3-Trichlorobenzene	<1.0		0.36	1.0	
1,2,4-Trichlorobenzene	<1.0		0.22	1.0	
1,1,1-Trichloroethane	<1.0		0.26	1.0	
1,1,2-Trichloroethane	<1.0		0.30	1.0	
Trichloroethene	0.23	J	0.18	1.0	
Trichlorofluoromethane	<1.0		0.22	1.0	
1,2,3-Trichloropropane	<1.2		0.60	1.2	
1,2,4-Trimethylbenzene	<1.0		0.22	1.0	
1,3,5-Trimethylbenzene	<1.0		0.23	1.0	
Vinyl chloride	<1.0		0.13	1.0	
o-Xylene	<1.0		0.13	1.0	
m&p-Xylene	<2.0		0.30	2.0	
Xylenes, Total	<1.0		0.30	1.0	
Surrogate	%Rec	Qualifier	renovament en alla companya de la companya de la companya de la companya de la companya de la companya de la c	ance Limits	****
4-Bromofluorobenzene (Surr)	86		75 - 12	0	
Dibromofluoromethane	91		85 - 11	5	
1,2-Dichloroethane-d4 (Surr)	93		70 - 12	0	

97

Toluene-d8 (Surr)

Job Number: 500-45518-1 Client: Toltest Inc.

Client Sample ID: JP-M13-GWMW362

500-45518-3 Lab Sample ID:

Client Matrix: Water Date Sampled: 04/16/2012 1600 Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B Prep Method:

Analysis Batch: 500-147778

Instrument ID: CMS19

45518-03.D

Dilution:

5030B 1.0

Prep Batch: N/A

Lab File ID:

Initial Weight/Volume: 5 mL

Analysis Date:

04/27/2012 0238

Final Weight/Volume: 5 mL

inalyone Date.	0 1/2//2012	
Prep Date:	04/27/2012	0238

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0 05		0.21	1.0 1.0
p-Isopropyltoluene	<1.0		0.24 0.63	3.0
Methylene Chloride	<3.0		0.63	5.0 5.0
4-Methyl-2-pentanone (MIBK)	<5.0		U.18	J.U

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW362

Lab Sample ID:

500-45518-3

Client Matrix:

Water

Date Sampled: 04/16/2012 1600

Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B

Analysis Batch: 500-147778

Instrument ID:

CMS19

Prep Method:

5030B

Prep Batch:

N/A

Lab File ID:

45518-03.D

Dilution:

1.0

Initial Weight/Volume: 5 mL

Analysis Date:

04/27/2012 0238

Final Weight/Volume: 5 mL

04/27/2012 0238

Analyte	Result (ug/L)	Qualifier	MDL	RL	
Methyl tert-butyl ether	<1.0	4. ************************************	0.28	1.0	***************************************
Naphthalene	<1.0		0.24	1.0	
N-Propylbenzene	<1.0		0.19	1.0	
Styrene	<1.0		0.26	1.0	
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0	
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0	
Tetrachloroethene	<1.0		0.22	1.0	
Toluene	<1.0		0.15	1.0	
1,2,3-Trichlorobenzene	<1.0		0.36	1.0	
1,2,4-Trichlorobenzene	<1.0		0.22	1.0	
1,1,1-Trichloroethane	<1.0		0.26	1.0	
1,1,2-Trichloroethane	<1.0		0.30	1.0	
Trichloroethene	<1.0		0.18	1.0	
Trichlorofluoromethane	<1.0		0.22	1.0	
1,2,3-Trichloropropane	<1.2		0.60	1.2	
1,2,4-Trimethylbenzene	<1.0		0.22	1.0	
1,3,5-Trimethylbenzene	<1.0		0.23	1.0	
Vinyl chloride	<1.0		0.13	1.0	
o-Xylene	<1.0		0.13	1.0	
m&p-Xylene	<2.0		0.30	2.0	
Xylenes, Total	<1.0		0.30	1.0	
0 1	9/ Dag	Qualifier	Accept	ance l imite	

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	92	,	75 - 120
Dibromofluoromethane	98		85 - 115
1,2-Dichloroethane-d4 (Surr)	95		70 - 120
Toluene-d8 (Surr)	105		85 - 120

Job Number: 500-45518-1 Client: Toltest Inc.

Client Sample ID: JP-M13-GWMW999

Lab Sample ID: 500-45518-4

Client Matrix: Water Date Sampled: 04/16/2012 1200 Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B

Analysis Batch:

500-147778

Instrument ID:

CMS19

Prep Method: Dilution:

5030B

Prep Batch:

N/A

Lab File ID: Initial Weight/Volume: 5 mL

45518-04.D

Analysis Date:

1.0

04/27/2012 0302

Final Weight/Volume: 5 mL

Prep Date:

04/27/2012 0302

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0 び		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0
· mean, a pointaine (mile v)				

0.79 Crs/20/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW999

Lab Sample ID:

500-45518-4

Client Matrix:

Water

Date Sampled: 04/16/2012 1200

Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B

5030B

Analysis Batch: 500-147778

Instrument ID:

CMS19

Prep Method: Dilution:

1.0

Prep Batch:

N/A

Lab File ID:

45518-04.D

Initial Weight/Volume: 5 mL

Analysis Date:

04/27/2012 0302

Prep Date:

04/27/2012 0302

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Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0
Surrogate	%Rec	Qualifier	Acceptance Li	mits
4-Bromofluorobenzene (Surr)	91	%++1423420000000000000000000000000000000000	75 - 120	
Dibromofluoromethane	93		85 - 115	
1,2-Dichloroethane-d4 (Surr)	97		70 - 120	
Toluene-d8 (Surr)	98		85 - 120	

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW809

Lab Sample ID:

500-45518-5

Client Matrix:

Water

Date Sampled: 04/16/2012 1327 Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B

Analysis Batch:

500-147778

Instrument ID:

CMS19

Prep Method:

5030B

Lab File ID:

Dilution:

1.0

Prep Batch:

N/A

Initial Weight/Volume: 5 mL

45518-05.D

Analysis Date:

04/27/2012 0325

Final Weight/Volume: 5 mL

Prep	Date:

04/27/2012 0325

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0	en en en en en en en en en en en en en e	1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0 1.0
trans-1,3-Dichloropropene	<1.0		0.35	***
Ethylbenzene	<1.0		0.14	1.0 5.0
2-Hexanone	<5.0		0.56	1.0
Hexachlorobutadiene	<1.0 <1.0 び ろ		0.45	1.0
Isopropylbenzene			0.21	1.0
p-Isopropyltoluene	<1.0		0.24 0.63	3.0
Methylene Chloride	<3.0		0.63 0.79	5.0 5.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.19	5.0

ces/30/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW809

Lab Sample ID:

500-45518-5

Client Matrix:

Water

Date Sampled: 04/16/2012 1327 Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B

Analysis Batch:

500-147778

Instrument ID:

CMS19

Prep Method:

5030B

Lab File ID:

Dilution:

Prep Batch:

N/A

45518-05.D

1.0

Initial Weight/Volume: 5 mL

Analysis Date: Prep Date:

04/27/2012 0325 04/27/2012 0325 Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0
Surrogate	%Rec	Qualifier	Accepta	ance Limits
4-Bromofluorobenzene (Surr)	92	e regerging a residence against a communication of the fill of the configuration of the confi	75 - 120	0

96

96

101

85 - 115

70 - 120

85 - 120

Dibromofluoromethane

Toluene-d8 (Surr)

1,2-Dichloroethane-d4 (Surr)

Job Number: 500-45518-1 Client: Toltest Inc.

JP-M13-GWMW806 Client Sample ID:

500-45518-6 Lab Sample ID:

Client Matrix: Water Date Sampled: 04/16/2012 1223 Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B

Analysis Batch: 500-147778

Instrument ID:

CMS19

Prep Method: Dilution:

5030B

Prep Batch:

N/A

Lab File ID:

45518-06.D Initial Weight/Volume: 5 mL

1.0

04/27/2012 0349

Final Weight/Volume: 5 mL

Analysis Date: Prep Date:

04/27/2012 0349

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0	01.000.0 00 .000.000.000.000.000.000.000.0	1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0 VS		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

025/30/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW806

Lab Sample ID:

500-45518-6

Client Matrix:

Water

Date Sampled: 04/16/2012 1223

Date Received: 04/17/2012 1230

8260B VOC

Analysis Method:

8260B

Analysis Batch:

500-147778

Instrument ID:

CMS19

Prep Method:

5030B

Lab File ID:

45518-06.D

RL

1.0

1.0

1.0

1.0

1.0

1.0

1.0

1.0

1.0

1.0

1.0

1.0

1.0

Dilution:

1.0

Prep Batch:

N/A

Initial Weight/Volume:

5 mL

Analysis Date: Prep Date:

04/27/2012 0349 04/27/2012 0349 Final Weight/Volume:

MDL

5 mL

Analyta
Analyte
Methyl tert-butyl ether
Naphthalene
N-Propylbenzene
Styrene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrachloroethene
Toluene
1,2,3-Trichlorobenzene
1,2,4-Trichlorobenzene
1.1.1-Trichloroethane

1,1,1-Trichloroethane 1,1,2-Trichloroethane Trichloroethene

Trichlorofluoromethane 1,2,3-Trichloropropane 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene

Vinyl chloride o-Xylene m&p-Xylene Xylenes, Total

Surrogate 4-Bromofluorobenzene (Surr) Dibromofluoromethane 1,2-Dichloroethane-d4 (Surr) Toluene-d8 (Surr)

<1.0 <1.0 <1.0 <1.0 <1.0 <1.0

Result (ug/L)

<1.0 <1.0 <1.0 <1.0

<1.0 <1.0 <1.0 <1.0 <1.2 <1.0 <1.0

<1.0 <1.0 <2.0 <1.0

0.28 0.24 0.19 0.26 0.31 0.35

Qualifier

Qualifier

0.22 0.15 0.36 0.22 0.26 0.30

0.30

1.0 0.18 1.0 0.22 0.60 1.2 1.0 0.22 1.0 0:23 1.0 0.13 1.0 0.13 0.30 2.0

> Acceptance Limits 75 - 120 85 - 115 70 - 120

> > 85 - 120

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW807

Lab Sample ID:

500-45518-7

Client Matrix:

Water

Date Sampled: 04/16/2012 1127

Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B

Analysis Batch:

500-147778

Instrument ID:

CMS19

Prep Method:

5030B

Prep Batch:

Lab File ID:

45518-07.D

Dilution:

1.0

N/A

Initial Weight/Volume: 5 mL

Analysis Date:

04/27/2012 0412

Prep Date:

04/27/2012 0412

rillai	AAGIÉ

Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1.4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0 グ		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

TestAmerica Chicago

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025/30/12

05/08/2012

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW807

Lab Sample ID:

500-45518-7

Client Matrix:

Water

Date Sampled: 04/16/2012 1127

Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B

Analysis Batch:

500-147778

Instrument ID:

CMS19

Prep Method:

5030B

Prep Batch:

Lab File ID:

45518-07.D

Dilution:

1.0

N/A

Initial Weight/Volume: 5 mL

Analysis Date:

04/27/2012 0412

Final Weight/Volume: 5 mL

Prep	Date:

04/27/2012 0412

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0	**************************************	0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachioroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits	70000000000000000000000000000000000000
4-Bromofluorobenzene (Surr)	91	can a significant de la company de la compan	75 - 120	
Dibromofluoromethane	95		85 - 115	
1,2-Dichloroethane-d4 (Surr)	96		70 - 120	
Toluene-d8 (Surr)	102		85 - 120	

VALIDATION COMPLETENESS WORKSHEET LDC #: 27649A1 SDG #: 500-45518-1 Level III Laboratory: Test America, Inc. Reviewer: 2nd Reviewer: METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Technical holding times	4	Sampling dates: 4/16/2
II.	GC/MS Instrument performance check	Α	, ,
III.	Initial calibration	A	% R = 30/15
IV.	Continuing calibration/ICV	-9W	ce//0/= 20
V.	Blanks	A	,
VI.	Surrogate spikes	4	
VII.	Matrix spike/Matrix spike duplicates	À	
VIII.	Laboratory control samples	4	ics
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards		
XI.	Target compound identification	N N	
XII.	Compound quantitation/RL/LOQ/LODs	N _	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	4	
XVI.	Field duplicates	ND	D= 3+4
XVII.	Field blanks	N	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate TB = Trip blank

EB = Equipment blank

Validated Samples:

	· W					
1	JP-M13-GWMW808	11	MB 500-147778	21		31
2	JP-M13-GWMW126R	12 ²	147785	22		32
3	JP-M13-GWMW362	13		23		33
4	JP-M13-GWMW999	14_		24		34
5	JP-M13-GWMW809	15		25	4.2.4	35
6	JP-M13-GWMW806	16		26		36
7	JP-M13-GWMW807	17		27		37
82	JP-M13-GWMW126RMS	18		28		38
9 2	JP-M13-GWMW126RMSD	19		29		39
10		20		30		40

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chiorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. lodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	рррр.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	9999.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY, tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	uuuu.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	WW.

LDC # 2764 92

VALIDATION FINDINGS WORKSHEET **Continuing Calibration**

Reviewer: 2nd Reviewer:_

Page: 1 of 1

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A

Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?

Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF?

Associated Samples	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				1		 						
											and the second s		
Finding RRF (Limit: <u>></u> 0.05)													
Finding %D (Limit: <20.0%)	70.02												
Compound	۸۸												
Standard ID	(\alpha \)												
11 611 >	1/20/12					-							

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

JOAAP-GW

Collection Date:

April 16, 2012

LDC Report Date:

May 24, 2012

Matrix:

Water

Parameters:

Semivolatiles

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45518-1

Sample Identification

JP-M13-GWMW808

JP-M13-GWMW126R

JP-M13-GWMW362

JP-M13-GWMW999

JP-M13-GWMW809

JP-M13-GWMW806

JP-M13-GWMW807

JP-M13-GWMW126RMS

JP-M13-GWMW126RMSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals with the following exceptions:

Sample	Compound	Total Time From DFTPP Tuning Until Analysis	Required Analysis Time (in Hours) From DFTPP Tuning Until Analysis	Flag	A or P
JP-M13-GWMW126RMS	All TCL compounds	12 hrs. 25 min.	12 hrs.	None	Р
JP-M13-GWMW126RMSD	All TCL compounds	12 hrs. 47 min.	12 hrs.	None	Р

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs) with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
5/1/12	N-Nitrosodimethylamine 3&4-Methylphenol Dibenzofuran Di-n-butylphthalate Benzo(k)fluoranthene	33.0 19.0 17.0 17.0 22.0	All samples in SDG 500-45518-1	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	А

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
5/1/12	2-Methylnaphthalene Dibenzofuran Di-n-butylphthalate	20.3 21.3 20.5	All samples in SDG 500-45518-1	J (all detects) UJ (all non-detects)	А

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
JP-M13-GWMW126RMS/MSD (JP-M13-GWMW126R)	N-Nitrosodimethylamine Benzoic acid	-	- -	65 (≤30) 32 (≤30)	J (all detects) J (all detects)	А

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

Samples JP-M13-GWMW362 and JP-M13-GWMW999 were identified as field duplicates. No semivolatiles were detected in any of the samples with the following exceptions:

	Concentra	tion (ug/L)				
Compound	JP-M13-GWMW362	JP-M13-GWMW999	RPD (Limits)	Difference (Limits)	Flags	A or P
2,4-Dinitrotoluene	3.3	2.6	-	0.7 (≤1.3)	-	-
2,6-Dinitrotoluene	0.25	0.29	-	0.04 (≤0.47)	-	

JOAAP-GW Semivolatiles - Data Qualification Summary - SDG 500-45518-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45518-1	JP-M13-GWMW808 JP-M13-GWMW126R JP-M13-GWMW962 JP-M13-GWMW809 JP-M13-GWMW806 JP-M13-GWMW807	N-Nitrosodimethylamine 3&4-Methylphenol Dibenzofuran Di-n-butylphthalate Benzo(k)fluoranthene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	А	Initial calibration (%RSD)
500-45518-1	JP-M13-GWMW808 JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW999 JP-M13-GWMW809 JP-M13-GWMW806 JP-M13-GWMW807	2-Methylnaphthalene Dibenzofuran Di-n-butylphthalate	J (all detects) UJ (all non-detects)	А	Continuing calibration (ICV %D)
500-45518-1	JP-M13-GWMW126R	N-Nitrosodimethylamine Benzoic acid	J (all detects) J (all detects)	Α	Matrix spike/Matrix spike duplicate (RPD)

JOAAP-GW

Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

JOAAP-GW

Semivolatiles - Field Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW808

Lab Sample ID:

500-45518-1

Client Matrix: Water Date Sampled: 04/16/2012 1405 Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C Prep Method:

3510C

1.0

Analysis Date: Prep Date:

Dilution:

05/02/2012 2103 04/19/2012 0759

Analysis Batch: 500-148426 Prep Batch:

500-146890

Instrument ID:

Lab File ID:

CMS12 45518-1.D

Initial Weight/Volume: 1070 mL

Final Weight/Volume: 1.0 mL Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93	2007,000,000	0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chioro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyi phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9 <u>いろ</u>		0.33	1.9
Di-n-butyl phthalate	<4.7 US		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

TestAmerica Chicago

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05/08/2012

02 S/29/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW808

Lab Sample ID:

500-45518-1

Client Matrix:

Water

Date Sampled: 04/16/2012 1405 Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C

Analysis Batch: 500-148426

Instrument ID:

CMS12

Prep Method: Dilution:

3510C 1.0

Prep Batch:

500-146890

Lab File ID: Initial Weight/Volume: 1070 mL

45518-1.D

Analysis Date:

05/02/2012 2103

Final Weight/Volume: 1.0 mL

Prep Date:

04/19/2012 0759

Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 03		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
	<0.93		0.45	0.93
Pyrene	<1.9		0.28	1.9
1,2,4-Trichlorobenzene	<9.3		2.1	9.3
2,4,5-Trichlorophenol 2,4,6-Trichlorophenol	<4.7		1.0	4.7
	%Rec	Qualifier	Accepta	ance Limits
Surrogate	The state of the s		20 - 110	MATERIAL DE LA PROPERTICION DE PROPERTICION DE LA P
2-Fluorophenol	32		10 - 11	
Phenol-d5	25		40 - 110	
Nitrobenzene-d5	63		50 - 110	
2-Fluorobiphenyl	72		40 - 12	
2,4,6-Tribromophenol	83		50 - 13	
Terphenyl-d14	80		50 - 15	J

Job Number: 500-45518-1 Client: Toltest Inc.

Client Sample ID: JP-M13-GWMW126R

Lab Sample ID: Client Matrix:

500-45518-2

Water

Date Sampled: 04/16/2012 1525 Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C

Analysis Batch: 500-148426

Instrument ID:

CMS12

Prep Method: Dilution:

3510C 1.0

Prep Batch:

500-146890

Lab File ID: Initial Weight/Volume: 1070 mL

45518-2.D Final Weight/Volume: 1.0 mL

Analysis Date:

05/02/2012 2125

Injection Volume:

1 uL

Prep Date: 04/19/2012 0759

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93	**************************************	0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
	<4.7		0.85	4.7
4-Bromophenyl phenyl ether	<1.9		0.25	1.9
Butyl benzyl phthalate	<4.7		0.93	4.7
Carbazole	<9.3		2.0	9.3
4-Chloroaniline	<9.3		2.1	9.3
4-Chloro-3-methylphenol	<9.3 <1.9		0.32	1.9
2-Chloronaphthalene			0.75	4.7
2-Chlorophenol	<4.7		0.76	4.7
4-Chlorophenyl phenyl ether	<4.7		0.13	0.47
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.33	1.9
Dibenzofuran	<1.9 5		0.33 0.75	4.7
Di-n-butyl phthalate	<4.7 VJ			1.9
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7
TestAmerica Chicago	Page 38 of 840	6	orstraliz	05/08/20

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW126R

Lab Sample ID:

500-45518-2

Client Matrix:

Water

Date Sampled: 04/16/2012 1525

Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C

Analysis Batch: 500-148426

Instrument ID:

CMS12

Prep Method:

3510C

500-146890 Prep Batch:

Lab File ID:

45518-2.D Initial Weight/Volume: 1070 mL

Dilution:

1.0

05/02/2012 2125

Final Weight/Volume: 1.0 mL

Analysis Date: Prep Date:

04/19/2012 0759

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
	<9.3		2.0	9.3
2-Nitrophenol	<19		2.2	19
4-Nitrophenol	<0.93		0.32	0.93
N-Nitrosodiphenylamine	<0.47		0.13	0.47
N-Nitrosodi-n-propylamine	<9.3		5.2	9.3
Pentachlorophenol	<0.93		0.33	0.93
Phenanthrene	<4.7		0.34	4.7
Phenol	<0.93		0.45	0.93
Pyrene			0.48	1.9
1,2,4-Trichlorobenzene	<1.9		2.1	9.3
2,4,5-Trichlorophenol	<9.3		1.0	4.7
2,4,6-Trichlorophenol	<4.7		1.0	7.7

Surrogate	%Rec	Qualifier	Acceptance Limits	*****
2-Fluorophenol	30		20 - 110	
Phenol-d5	22		10 - 115	
Nitrobenzene-d5	55		40 - 110	
2-Fluorobiphenyl	59		50 - 110	
2,4,6-Tribromophenol	67		40 - 125	
Terphenyl-d14	81		50 - 135	

Job Number: 500-45518-1

Client: Toltest Inc.

JP-M13-GWMW362 Client Sample ID:

Lab Sample ID:

500-45518-3

Client Matrix:

Water

Date Sampled: 04/16/2012 1600 Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C 3510C Prep Method:

1.0

Dilution: Analysis Date: Prep Date:

05/02/2012 2148 04/19/2012 0759 Analysis Batch: 500-148426 Prep Batch:

500-146890

Instrument ID: Lab File ID:

CMS12 45518-3.D

Initial Weight/Volume: 1070 mL Final Weight/Volume: 1.0 mL Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL	manusament.
Acenaphthene	<0.93		0.34	0.93	
N-Nitrosodimethylamine	<9.3		1.3	9.3	
Acenaphthylene	<0.93		0.30	0.93	
Anthracene	<0.93		0.30	0.93	
Benzidine	<37		19	37 19	
Benzoic acid	<19		4.3		
Benzo[a]anthracene	<0.19		0.041	0.19	
Benzo[b]fluoranthene	<0.19		0.054	0.19	
Benzo[k]fluoranthene	<0.23		0.069	0.23	
Benzo[g,h,i]perylene	<0.93		0.39	0.93	
Benzo[a]pyrene	<0.19		0.052	0.19	
Benzyi alcohol	<19		2.9	19	
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9	
Bis(2-chloroethyl)ether	<1.9		0.33	1.9	
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9	
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3	
	<4.7		0.85	4.7	
4-Bromophenyl phenyl ether	<1.9		0.25	1.9	
Butyl benzyl phthalate	<4.7		0,93	4.7	
Carbazole	<9.3		2.0	9.3	
4-Chloroaniline	<9.3		2.1	9.3	
4-Chloro-3-methylphenol	<1.9		0.32	1.9	
2-Chloronaphthalene	<4.7		0.75	4.7	
2-Chlorophenol	<4.7		0.76	4.7	
4-Chlorophenyl phenyl ether	<0.47		0.13	0.47	
Chrysene	<0.28		0.060	0.28	
Dibenz(a,h)anthracene	<1.9 US		0.33	1.9	
Dibenzofuran	<4.7 VJ		0.75	4.7	
Di-n-butyl phthalate	<1.9		0.27	1.9	
1,2-Dichlorobenzene	<1.9		0.23	1.9	
1,3-Dichlorobenzene	<1.9		0.25	1.9	
1,4-Dichlorobenzene	<4.7		0.88	4.7	
3,3'-Dichlorobenzidine	<9.3		2.1	9.3	
2,4-Dichlorophenol	<1.9		0.41	1.9	
Diethyl phthalate	<9.3		3.1	9.3	
2,4-Dimethylphenol	<1.9		0.36	1.9	
Dimethyl phthalate	<19		4.6	19	
4,6-Dinitro-2-methylphenol	<19		6.9	19	
2,4-Dinitrophenol	3.3		0.28	1.3	
2,4-Dinitrotoluene	0.25	J	0.11	0.47	
2,6-Dinitrotoluene	<9.3	-	2.3	9.3	
Di-n-octyl phthalate	<0.93		0.30	0.93	
Fluoranthene	<0.93		0.36	0.93	
Fluorene	<4.7		0.65	4.7	
1,2-Diphenylhydrazine	<0.47		0.13	0.47	
Hexachlorobenzene	<4.7		1.0	4.7	
Hexachlorobutadiene	~4.1			•	
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05/08/2012

Job Number: 500-45518-1

Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMW362

Lab Sample ID:

500-45518-3

Client Matrix:

Water

Date Sampled: 04/16/2012 1600 Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: Prep Method:

Dilution:

8270C

3510C 1.0

Analysis Date: Prep Date:

2,4,5-Trichlorophenol

05/02/2012 2148 04/19/2012 0759 Analysis Batch: 500-148426 Prep Batch:

500-146890

Instrument ID: Lab File ID:

CMS12 45518-3.D Initial Weight/Volume: 1070 mL

Final Weight/Volume:

1.0 mL 1 uL

Injection Volume:

Prep Date: 04/19/2012 0/39	- u. (/l.)	Qualifier	MDL	RL
A ludo	Result (ug/L)	Quamo	0.91	4.7
Analyte	<4.7		0.079	0.23
Hexachloroethane	<0.23		0.27	1.9
Indeno[1,2,3-cd]pyrene	<1.9		0.12	0.47
Isophorone	<0.47			1.9
2-Methylnaphthalene	<1.9		0.29	1.9
2-Methylphenol	<1.9		0.41	0.93
3 & 4 Methylphenol	<0.93		0.28	4.7
Naphthalene	<4.7		1.0	9.3
2-Nitroaniline	<9.3		2.1	
3-Nitroaniline	<9.3		3.7	9.3
4-Nitroaniline	<0.93		0.42	0.93
Nitrobenzene			2.0	9.3
2-Nitrophenol	<9.3		2.2	19
4-Nitrophenol	<19		0.32	0.93
N-Nitrosodiphenylamine	<0.93		0.13	0.47
N-Nitrosodi-n-propylamine	<0.47		5.2	9.3
N-MILOSOUI-II-Propyramine	<9.3		0.33	0.93
Pentachlorophenol	<0.93		0.34	4.7
Phenanthrene	<4.7		0.45	0.93
Phenol	<0.93		0.28	1.9
Pyrene	<1.9			9.3
1,2,4-Trichlorobenzene	<9.3		2.1	4.7
2.4.5 Trichlorophenol			1.0	***

2,4,6-Trichlorophenol	<4.7		•
2,4,0 1110	%Rec	Qualifier	Acceptance Limits
Surrogate	27	anterioria de Comentacione de Comentacione de Comentacione de Comentacione de Comentacione de Comentacione de C	20 - 110
2-Fluorophenol	20		10 - 115 40 - 110
Phenol-d5	52		50 - 110
Nitrobenzene-d5	51		40 - 125
2-Fluorobiphenyl 2,4,6-Tribromophenol	77		50 - 135
Terphenyl-d14	76		

<4.7

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW999

Lab Sample ID:

500-45518-4

Client Matrix:

Water

Date Sampled: 04/16/2012 1200 Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C

3510C

Analysis Batch:

500-148426

Instrument ID: Lab File ID:

CMS12

Prep Method: Dilution:

Prep Batch:

500-146890

Initial Weight/Volume:

45518-4.D

1.0

1070 mL

Analysis Date:

Final Weight/Volume:

1.0 mL

Prep Date:

05/02/2012 2211 04/19/2012 0759

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9 <i>い</i> び		0.33	1.9
Di-n-butyl phthalate	<4.7 び		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	2.6		0.28	1.3
2,6-Dinitrotoluene	0.29	J	0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW999

Lab Sample ID:

500-45518-4

Client Matrix:

Water

Date Sampled: 04/16/2012 1200

Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C

Analysis Batch:

500-148426

Instrument ID:

CMS12

Prep Method: Dilution:

3510C

Prep Batch:

500-146890

Lab File ID:

45518-4.D

1.0

Initial Weight/Volume: 1070 mL

Analysis Date:

05/02/2012 2211

Final Weight/Volume:

1.0 mL

Prep Date:

04/19/2012 0759

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7	00.000 (100.0000000)	0.91	4.7
ndeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
sophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 ひず		0.12	0.47
2-Methylphenoi	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
l-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
,2,4-Trichlorobenzene	<1.9		0.28	1.9
4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7
Surrogate	%Rec	Qualifier	Accepta	nce Limits
-Fluorophenol	29	20 - 110		
Phenol-d5	20		10 - 115	
litrobenzene-d5	53		40 - 110	
-Fluorobiphenyl	55		50 - 110	
,4,6-Tribromophenol	64		40 - 125	
	00		50 405	

83

50 - 135

Terphenyl-d14

Job Number: 500-45518-1 Client: Toltest Inc.

Client Sample ID: JP-M13-GWMW809

Lab Sample ID: Date Sampled: 04/16/2012 1327 500-45518-5 Date Received: 04/17/2012 1230 Client Matrix: Water

8270C SVOC

Analysis Method: 8270C Prep Method: 3510C

Dilution: 1.0

Analysis Date: Prep Date:

05/02/2012 2234 04/19/2012 0759 Analysis Batch: 500-148426 Instrument ID: Lab File ID: Prep Batch: 500-146890

45518-5.D Initial Weight/Volume: 1070 mL Final Weight/Volume:

1.0 mL Injection Volume: 1 uL

CMS12

Analyte	Result (ug/L)	Qualifier	MDL	RL	
Acenaphthene	<0.93		0.34	0.93	************
N-Nitrosodimethylamine	<9.3		1.3	9.3	
Acenaphthylene	< 0.93		0.30	0.93	
Anthracene	< 0.93		0.30	0.93	
Benzidine	<37		19	37	
Benzoic acid	<19		4.3	19	
Benzo[a]anthracene	<0.19		0.041	0.19	
Benzo[b]fluoranthene	<0.19		0.054	0.19	
Benzo[k]fluoranthene	<0.23		0.069	0.23	
Benzo[g,h,i]perylene	<0.93		0.39	0.93	
Benzo[a]pyrene	<0.19		0.052	0.19	
Benzyl alcohol	<19		2.9	19	
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9	
Bis(2-chloroethyl)ether	<1.9		0.33	1.9	
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9	
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3	
4-Bromophenyl phenyl ether	<4.7		0.85	4.7	
Butyl benzyl phthalate	<1.9		0.25	1.9	
Carbazole	<4.7		0.93	4.7	
4-Chloroaniline	<9.3		2.0	9.3	
4-Chloro-3-methylphenol	<9.3		2.1	9.3	
2-Chloronaphthalene	<1.9		0.32	1.9	
2-Chlorophenol	<4.7		0.75	4.7	
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7	
Chrysene	<0.47		0.13	0.47	
Dibenz(a,h)anthracene	<0.28		0.060	0.28	
Dibenzofuran	<1.9 05		0.33	1.9	
Di-n-butyl phthalate	<4.7 5		0.75	4.7	
1,2-Dichlorobenzene	<1.9		0.27	1.9	
1,3-Dichlorobenzene	<1.9		0.23	1.9	
1,4-Dichlorobenzene	<1.9		0.25	1.9	
3,3'-Dichlorobenzidine	<4.7		0.88	4.7	
2,4-Dichlorophenol	<9.3		2.1	9.3	
Diethyl phthalate	<1.9		0.41	1.9	
2,4-Dimethylphenol	<9.3		3.1	9.3	
Dimethyl phthalate	<1.9		0.36	1.9	
4,6-Dinitro-2-methylphenol	<19		4.6	19	
2,4-Dinitrophenol	<19		6.9	19	
2,4-Dinitrotoluene	<1.3		0.28	1.3	
2,6-Dinitrotoluene	<0.47		0.11	0.47	
Di-n-octyl phthalate	<9.3		2.3	9.3	
Fluoranthene	<0.93		0.30	0.93	
Fluorene	<0.93		0.36	0.93	
1,2-Diphenylhydrazine	<4.7		0.65	4.7	
Hexachlorobenzene	<0.47		0.13	0.47	
Hexachlorobutadiene	<4.7		1.0	4.7	
110/00/110/00444410110	,		,. .		

TestAmerica Chicago

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as/29/12 05/08/2012

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW809

Lab Sample ID:

500-45518-5

Client Matrix:

Water

Date Sampled: 04/16/2012 1327

Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C

3510C

Analysis Batch:

500-148426

Instrument ID:

CMS12

Prep Method: Dilution:

Prep Batch:

500-146890

Lab File ID: Initial Weight/Volume:

45518-5.D

Surrogate

Phenol-d5

2-Fluorophenol

Nitrobenzene-d5

2-Fluorobiphenyl

Terphenyl-d14

2,4,6-Tribromophenol

1.0

Final Weight/Volume:

1070 mL 1.0 mL

Analysis Date: Prep Date:

05/02/2012 2234 04/19/2012 0759

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 US		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

%Rec

28

18

53

53

60

75

Qualifier

Acceptance Limits

20 - 110

10 - 115 40 - 110

50 - 110

40 - 125

50 - 135

Client: Toltest Inc. Job Number: 500-45518-1

Client Sample ID: JP-M13-GWMW806

Lab Sample ID: 500-45518-6

Client Matrix: Water

Date Sampled: 04/16/2012 1223 Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C Prep Method: 3510C

Dilution: 1.0

Analysis Date: Prep Date:

1.0 15/02/2012 22

05/02/2012 2256 04/19/2012 0759 Analysis Batch: 500 Prep Batch: 500

500-148426 500-146890 Instrument ID: Lab File ID: CMS12 45518-6.D

Initial Weight/Volume: Final Weight/Volume:

1070 mL 1.0 mL

Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL	
Acenaphthene	<0.93		0.34	0.93	
N-Nitrosodimethylamine	<9.3		1.3	9.3	
Acenaphthylene	<0.93		0.30	0.93	
Anthracene	<0.93		0.30	0.93	
Benzidine	<37		19	37	
Benzoic acid	<19		4.3	19	
Benzo[a]anthracene	<0.19		0.041	0.19	
Benzo[b]fluoranthene	<0.19		0.054	0.19	
Benzo[k]fluoranthene	<0.23		0.069	0.23	
Benzo[g,h,i]perylene	<0.93		0.39	0.93	
Benzo[a]pyrene	<0.19		0.052	0.19	
Benzyl alcohol	<19		2.9	19	
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9	
Bis(2-chloroethyl)ether	<1.9		0.33	1.9	
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9	
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3	
4-Bromophenyl phenyl ether	<4.7		0.85	4.7	
Butyl benzyl phthalate	<1.9		0.25	1.9	
Carbazole	<4.7		0.93	4.7	
4-Chloroaniline	<9.3		2.0	9.3	
4-Chloro-3-methylphenol	<9.3		2.1	9.3	
2-Chloronaphthalene	<1.9		0.32	1.9	
•	<4.7		0.75	4.7	
2-Chlorophenol	<4.7		0.76	4.7	
4-Chlorophenyl phenyl ether	<0.47		0.73	0.47	
Chrysene	<0.28		0.13	0.28	
Dibenz(a,h)anthracene	<0.26 <1.9 グ		0.33	1.9	
Dibenzofuran	<4.7 VS		0.33	4.7	
Di-n-butyl phthalate			0.73	1.9	
1,2-Dichlorobenzene	<1.9				
1,3-Dichlorobenzene	<1.9		0.23	1.9 1.9	
1,4-Dichlorobenzene	<1.9		0.25		
3,3'-Dichlorobenzidine	<4.7		0.88	4.7	
2,4-Dichlorophenol	<9.3		2.1	9.3	
Diethyl phthalate	<1.9		0.41	1.9	
2,4-Dimethylphenol	<9.3		3.1	9.3	
Dimethyl phthalate	<1.9		0.36	1.9	
4,6-Dinitro-2-methylphenol	<19		4.6	19	
2,4-Dinitrophenol	<19		6.9	19	
2,4-Dinitrotoluene	<1.3		0.28	1.3	
2,6-Dinitrotoluene	<0.47		0.11	0.47	
Di-n-octyl phthalate	<9.3		2.3	9.3	
Fluoranthene	<0.93		0.30	0.93	
Fluorene	< 0.93		0.36	0.93	
1,2-Diphenylhydrazine	<4.7		0.65	4.7	
Hexachiorobenzene	< 0.47		0.13	0.47	
Hexachlorobutadiene	<4.7		1.0	4.7	

RS/29/12 05/08/2012

Job Number: 500-45518-1 Client: Toltest Inc.

Client Sample ID:

JP-M13-GWMW806

Lab Sample ID:

500-45518-6

Client Matrix:

Water

Date Sampled: 04/16/2012 1223

Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C

3510C

Analysis Batch: 500-148426

Instrument ID:

CMS12

Prep Method: Dilution:

Prep Batch:

500-146890

Lab File ID: Initial Weight/Volume: 1070 mL

45518-6.D

Analysis Date:

1.0

Final Weight/Volume:

1.0 mL

Prep Date:

05/02/2012 2256 04/19/2012 0759

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7	**************************************	0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 ひ づ		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	< 0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	< 0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	26	CONTROL CONTRO	20 - 110
Phenol-d5	20		10 - 115
Nitrobenzene-d5	55		40 - 110
2-Fluorobiphenyl	55		50 - 110
2,4,6-Tribromophenol	66		40 - 125
Terphenyl-d14	77		50 - 135

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW807

Lab Sample ID:

500-45518-7

Client Matrix: Water Date Sampled: 04/16/2012 1127 Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method:

8270C

Analysis Batch: 500-148426

Instrument ID:

CMS12

Prep Method:

3510C

Prep Batch:

500-146890

Lab File ID:

45518-7.D

Dilution:

1.0

Initial Weight/Volume: 1070 mL Final Weight/Volume:

> MDL 0.34

1.3

0.30 0.30

19 4.3

0.041

0.054

0.069

0.39 0.052

2.9

0.28 0.33

0.28

2.3

0.85

0.25

0.93 2.0

2.1

0.32

0.75 0.76

0.13

0.060

0.33

0.75

0.27

0.23 0.25

0.88

2.1 0.41

3.1 0.36

4.6

6.9

0.28

0.11

2.3

0.30

0.36

0.65

0.13

1.0

1.0 mL

RL

0.93 9.3

0.93

0.93 37

19

0.19

0.19

0.23 0.93

0.19

19 1.9

1.9

1.9 9.3

4.7

1.9

4.7

9.3 9.3

1.9

4.7

4.7

0.47

0.28 1.9

4.7

1.9

1.9

1.9

4.7 9.3

1.9 9.3

1.9

19

19

1.3

0.47

9.3

0.93

0.93

4.7 0.47

4.7

Analysis Date: Prep Date:

05/02/2012 2319 04/19/2012 0759

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier
Acenaphthene	<0.93	
N-Nitrosodimethylamine	<9.3	
Acenaphthylene	<0.93	
Anthracene	<0.93	
Benzidine	<37	
Benzoic acid	<19	
Benzo[a]anthracene	<0.19	
Benzo[b]fluoranthene	<0.19	
Benzo[k]fluoranthene	<0.23	
Benzo[g,h,i]perylene	<0.93	
Benzo[a]pyrene	<0.19	
Benzyl alcohol	<19	
Bis(2-chloroethoxy)methane	<1.9	
Bis(2-chloroethyl)ether	<1.9	
2,2'-oxybis[1-chloropropane]	<1.9	
Bis(2-ethylhexyl) phthalate	<9.3	
4-Bromophenyl phenyl ether	<4.7	
Butyl benzyl phthalate	<1.9	
Carbazole	<4.7	
4-Chloroaniline	<9.3	
4-Chloro-3-methylphenol	<9.3	
2-Chloronaphthalene	<1.9	
2-Chlorophenol	<4.7	
4-Chiorophenyl phenyl ether	<4.7	
Chrysene	<0.47	
Dibenz(a,h)anthracene	<0.28	
Dibenzofuran	<1.9 US	
Di-n-butyl phthalate	<4.7 V3	
1,2-Dichlorobenzene	<1.9	
1,3-Dichlorobenzene	<1.9	
1,4-Dichlorobenzene	<1.9	
3,3'-Dichlorobenzidine	<4.7	
2,4-Dichlorophenol	<9.3	
Diethyl phthalate	<1.9	
2,4-Dimethylphenol	<9.3	
Dimethyl phthalate	<1.9	
4,6-Dinitro-2-methylphenol	<19	
2,4-Dinitrophenol	<19	
2,4-Dinitrotoluene	<1.3	
2,6-Dinitrotoluene	<0.47	
Di-n-octyl phthalate	<9.3	
Fluoranthene	<0.93	
Fluorene	<0.93	
1,2-Diphenylhydrazine	<4.7	
Hexachlorobenzene	<0.47	
1 IEVACIIIOIODEIIVELIE	-4.7	

Hexachlorobutadiene

<4.7

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW807

Lab Sample ID:

500-45518-7

Client Matrix:

Water

Date Sampled: 04/16/2012 1127 Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C

Analysis Batch:

500-148426

Instrument ID:

CMS12

Prep Method:

3510C

Prep Batch:

500-146890

Lab File ID:

45518-7.D

Dilution:

1.0

Qualifier

Initial Weight/Volume: 1070 mL

1.0 mL

Analysis Date:

05/02/2012 2319

Final Weight/Volume:

Prep Date:

Surrogate

Phenol-d5

2-Fluorophenol

Nitrobenzene-d5

2-Fluorobiphenyl

Terphenyl-d14

2,4,6-Tribromophenol

04/19/2012 0759

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 U S		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

%Rec

31

22

58

57

70

78

Acceptance Limits

20 - 110

10 - 115

40 - 110

50 - 110

40 - 125

50 - 135

LDC #:	27649A2	VALIDATION COMPLETENESS WORKSHEET	Date: <u>5/24/1</u> 2
SDG #:	500-45518-1	Level İll	Page: 10f 1
Laborator	y: Test America, Inc.	·	Reviewer:
			2nd Reviewer:

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
<u>.</u>	Technical holding times	A	Sampling dates: 4/16/52
II.	GC/MS Instrument performance check	SW	7
111.	Initial calibration	SW	9,29D = 30/15, 12
IV.	Continuing calibration/ICV	SW	ccv/101 = 20 /2
V.	Blanks		,
VI.	Surrogate spikes		
VII.	Matrix spike/Matrix spike duplicates	_\$₩	
VIII.	Laboratory control samples		lCs .
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	4	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	SW	D=3+4
XVII.	Field blanks	N	

Note: A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate FB = Field blank D = Duplicate TB = Trip blank

EB = Equipment blank

Validated Samples:

	<u> </u>		1000			
1	JP-M13-GWMW808	11	MB_500-149998	21	31	
2	JP-M13-GWMW126R	12		22	32	
3	JP-M13-GWMW362	13		23	 33	
4	JP-M13-GWMW999	14		24	 34	
5	JP-M13-GWMW809	15		25	35	
6	JP-M13-GWMW806	16		26	36	
7	JP-M13-GWMW807	17		27	37	
8	JP-M13-GWMW126RMS	18		28	38	
9	JP-M13-GWMW126RMSD	19		29	39	
10		20		30	40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA

A. Phenol	S. Naphthalene	KK. 2,4-Dinitrotoluene	CCC. Benzo(a)anthracene	UUU.Benzo(b)thiophene
B. Bis (2-chloroethyl) ether	T. 4-Chloroaniline	LL. Diethylphthalate	DDD. Chrysene	VVV. Naphthobenzothiophene
C. 2-Chlorophenol	U. Hexachlorobutadiene	MM. 4-Chlorophenyl-phenyl ether	EEE. Bis(2-ethylhexyl)phthalate	WWW.Benzo(e)pyrene
D. 1,3-Dichlorobenzene	V. 4-Chloro-3-methylphenol	NN. Fluorene	FFF. Di-n-octylphthalate	XXX. 2,6-Dimethylnaphthalene
E. 1,4-Dichlorobenzene	W. 2-Methylnaphthalene	OO. 4-Nitroaniline	GGG. Benzo(b)fluoranthene	YYY. 2,3,5-Trimethylnaphthalene
F. 1,2-Dichlorobenzene	X. Hexachlorocyclopentadiene	PP. 4,6-Dinitro-2-methylphenol	HHH. Benzo(k)fluoranthene	ZZZ. Perylene
G. 2-Methylphenol	Y. 2,4,6-Trichlorophenol	QQ. N-Nitrosodiphenylamine (1)	III. Benzo(a)pyrene	AAAA. Dibenzothiophene
H. 2,2'-Oxybis(1-chloropropane)	Z. 2,4,5-Trichlorophenol	RR. 4-Bromophenyl-phenylether	JJJ. Indeno(1,2,3-cd)pyrene	BBBB. Benzo(a)fluoranthene
I. 4-Methylphenol	AA. 2-Chloronaphthalene	SS. Hexachlorobenzene	KKK. Dibenz(a,h)anthracene	CCCC. Benzo(b)fluorene
J. N-Nitroso-di-n-propylamine	BB. 2-Nitroaniline	TT. Pentachlorophenol	LLL. Benzo(g,h,i)perylene	DDDD. cis/frans-Decalin
K. Hexachloroethane	CC. Dimethylphthalate	UU. Phenanthrene	MMM. Bis(2-Chloroisopropyl)ether	EEEE. Biphenyl
L. Nitrobenzene	DD. Acenaphthylene	VV. Anthracene	NNN. Aniline	FFFF. Retene
M. Isophorone	EE. 2,6-Dinitrotoluene	WW. Carbazole	OOO. N-Nitrosodimethylamine	GGGG. C30-Hopane
N. 2-Nitrophenol	FF. 3-Nitroaniline	XX. Di-n-butylphthalate	PPP. Benzolo Acid	HHHH. 1-Methylphenanthrene
O. 2,4-Dimethylphenol	GG. Acenaphthene	YY. Fluoranthene	QQQ. Benzyl alcohol	IIII. 2-Naphthylamine
P. Bis(2-chloroethoxy)methane	HH. 2,4-Dinitrophenol	ZZ. Pyrene	RRR. Pyridine	JJJJ. 1,4-Dioxane
Q. 2,4-Dichlorophenol	II. 4-Nitrophenol	AAA. Butylbenzylphthalate	SSS. Benzidine	KKKK.
R. 1,2,4-Trichlorobenzene	JJ. Dibenzofuran	BBB. 3,3'-Dichlorobenzidine	TTT. 1-Methylnaphthalene	LLLL.

VALIDATION FINDINGS WORKSHEET **GC/MS Performance Check**

Reviewer:_ 2nd Reviewer:

Page: ___

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". X NA

Were the DFTPP performance results reviewed and found to be within the EPA Functional Guideline criteria? Were all samples analyzed within the 12 hour clock criteria? AN(N

#	Laboratory ID	12 Hour Clock (Time/date)	Finding	Associated Samples Client ID	Qualifications
	8	2 yes 25 mins			hone of
	6	2 hus 47 mile			-
<u>z/w</u>	ION ABUNDANCE CRITERIA	TERIA	<u>z/w</u>	ION ABUNDANCE CRITERIA	<u>IIA</u>
51 68 69 70 127 197	30.0 - 60.0% of m/z 198 Less than 2.0% of m/z 69 Present Less than 2.0% of 69 40.0 - 60.0% of m/z 198 Less than 1.0% of m/z 198 Base peak, 100% relative abundance	3 59 198 7e abundance	199 5.C 275 10 365 Gn 441 Pre 442 Gr 443 17	5.0 - 9.0% of m/z 198 10.0 - 30.0% of m/z 198 Greater than 1.0% of m/z 198 Present, but less than m/z 443 Greater than 40.0% of m/z 198 17.0 - 23.0% of m/z 442	

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VALIDATION FINDINGS WORKSHEET Initial Calibration

Reviewer:__ 2nd Reviewer:_

Page: 1of 1

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N/A

N N/A N/N(N

Did the laboratory conduct an acceptable 5 point calibration prior to sample analysis?

Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?

Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?

Did the initial calibration meet the acceptance criteria? Were all %RSDs and RRFs within the validation criteria of $\le\!30$ %RSD and $\ge\!0.05$ RRF ?

																	Ī
Qualifications	JAM /A																
Associated Samples	Acc																
Finding RRF (Limit: <u>></u> 0.05)																	
Finding %RSD Finding (Limit: <30.0%) (Limit: 5					22.0												
Compound	900	3 p 4 Netholonal	JI20"	×	444												
Standard ID Compound (Lim	1921																
ate	17/1/5		_														
) #																	

LDC#: 2764942

VALIDATION FINDINGS WORKSHEET Continuing Calibration

Reviewer:____

Page:__

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Please see qualifications b

N N/A Was a α

Y/N N/A Were pe

Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument? Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?

Were percent differences (%D) and relative response factors (KKF) within method criter Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

Qualifications	J/17/7										The state of the s						
Associated Samples	m	,															
Finding RRF (Limit: <u>></u> 0.05)																	
Finding %D (Limit: <20.0%)	20.5	21.3	25.5														
Compound	M	22	* *	,													
Standard ID	ICVI																
# Date	21/12	•															
	Щ			Щ	 	 <u> </u>		 					 	\square			<u>_</u>

LDC#2764942

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

Page:___ 2nd Reviewer:

lof /

Reviewer:

METHOD: GC/MS BNA

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated

N/N N/A

MS/MSD. Soil / Water.
Was a MS/MSD analyzed every 20 samples of each matrix?
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

	Qualifications	Trato A	\rightarrow															A DESCRIPTION												
) limits?	Associated Samples	λ														and the second														
Was a MS/MSD analyzed every 20 samples of each matrix? Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	RPD (Limits)	(567) 29	77 77	()	()	()	()	()	())	()	()	()	()			()		()		()	())		()	()	()	()	
x? ve percent difference:	MSD %R (Limits)	()	· ()	()	()	()	()	()	()		()	()	()	()	()		()	()	()	()	()	()	()			()	()	()	()	()
amples of each matrix? s (%R) and the relative	MS %R (Limits)	()	()	()	()	()	()	()	()		()	()	()	()	()		()	()	()		()	()	()	()	()	()	()	()	()	
ir. yzed every 20 sa ercent recoveries	Compound	02870	da																											
Was a MS/MSD analyzed every 20 samples of each Were the MS/MSD percent recoveries (%R) and the	DI DS/WSD ID	b/8																								9				
YN N/A	# Date	<u> </u>																												

LDC#: 27649A2

VALIDATION FINDINGS WORKSHEET

Field Duplicates

Page:_	<u></u>
Reviewer:	
2nd Reviewer:	0

METHOD: GC/MS SVOA

	Concentrati	on (ug/L)		(ug/L)	(ug/L)	
Compound	3	4	RPD	Difference	Limits	
кк	3.3	2.6		0.7	(≤ 1.3)	No qu
EE	0.25	0.29		0.04	(≤ 0.47)	70

V:\FIELD DUPLICATES\27649A2.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

JOAAP-GW

Collection Date:

April 16, 2012

LDC Report Date:

May 18, 2012

Matrix:

Water

Parameters:

Dissolved Metals

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45518-1

Sample Identification

JP-M13-GWMW808

JP-M13-GWMW126R

JP-M13-GWMW362

JP-M13-GWMW999

JP-M13-GWMW809

JP-M13-GWMW806

JP-M13-GWMW807

JP-M13-GWMW126RMS

JP-M13-GWMW126RMSD

JP-M13-GWMW126RDUP

Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B and 7470A for Dissolved Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Sodium, Thallium, Vanadium, and Zinc.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

ICP-MS was not utilized in this SDG.

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No dissolved metal contaminants were found in the initial, continuing and preparation blanks.

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
JP-M13-GWMW126RMS/MSD (All samples in SDG 500-45518-1)	Magnesium Sodium Mercury	•	70 (80-120) 76 (80-120) 77 (80-120)	-	J (all detects) UJ (all non-detects)	А

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

Samples JP-M13-GWMW362 and JP-M13-GWMW999 were identified as field duplicates. No metals were detected in any of the samples with the following exceptions:

	Concentra	ation (mg/L)				
Analyte	JP-M13-GWMW362	JP-M13-GWMW999	RPD (Limits)	Difference (Limits)	Flags	A or P
Aluminum	0.034	0.20U	-	0.166 (≤0.40)	-	-
Barium	0.041	0.042	-	0.001 (≤0.020)	-	-
Cadmium	0.00098	0.0010	-	0.00002 (≤0.0040)	-	-
Calcium	150	150	0	-	-	-
Iron	0.14	0.38	-	0.24 (≤0.40)	-	-
Magnesium	89	93	4	-	-	-
Manganese	0.078	0.078	0	-	-	

	Concentra	ation (mg/L)				
Analyte	JP-M13-GWMW362	JP-M13-GWMW999	RPD (Limits)	Difference (Limits)	Flags	A or P
Nickel	0.0042	0.0063	-	0.0021 (≤0.020)	<u>.</u>	-
Potassium	5.8	6.0	3	-	-	-
Sodium	200	210	5	-	-	-
Zinc	0.020U	0.011	-	0.009 (≤0.040)	-	-

JOAAP-GW Dissolved Metals - Data Qualification Summary - SDG 500-45518-1

SDG	Sample	Analyte	Flag	A or P	Reason
500-45518-1	JP-M13-GWMW808 JP-M13-GWMW126R JP-M13-GWMW362 JP-M13-GWMW999 JP-M13-GWMW809 JP-M13-GWMW806 JP-M13-GWMW807	Magnesium Sodium Mercury	J (all detects) UJ (all non-detects)	А	Matrix spike/Matrix spike duplicate (%R)

JOAAP-GW

Dissolved Metals - Laboratory Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

JOAAP-GW

Dissolved Metals - Field Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

ICP6

Job Number: 500-45518-1 Client: Toltest Inc.

JP-M13-GWMW808 Client Sample ID:

Date Sampled: 04/16/2012 1405 Lab Sample ID: 500-45518-1 Date Received: 04/17/2012 1230 Client Matrix: Water

6010B Metals (ICP)-Dissolved

Instrument ID: Analysis Batch: 500-147970 Analysis Method: 6010B Prep Batch: 500-147886 Lab File ID:

P6042712C.asc Prep Method: 3010A Initial Weight/Volume: 50 mL

1.0 Dilution: Final Weight/Volume: 50 mL Analysis Date: 04/28/2012 0032

Prep Date: 04/27/2012 0930

04/25/2012 1000

Prep Date:

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20	**************************************	0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.14		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00081	J	0.00054	0.0020
Calcium	100		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	0.016		0.0010	0.0050
Copper	0.0011	J	0.0011	0.010
Iron	2.6		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	59 5		0.024	0.10
Manganese	0.89		0.0011	0.010
Nickel	0.026	,	0.0019	0.010
Potassium	8.3		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	56 5		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	0.0069	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Instrument ID: HG6 7470A Analysis Batch: 500-147745 Analysis Method: Lab File ID: Prep Batch: 500-147564

042612R.CSV Prep Method: 7470A Initial Weight/Volume: 25 mL Dilution: 1.0

Final Weight/Volume: 25 mL 04/26/2012 1058 Analysis Date:

RL Qualifier MDL Result (ug/L) Analyte

0.20 0.070 <0.20 Mercury W

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW126R

Lab Sample ID:

500-45518-2

Client Matrix:

Water

Date Sampled: 04/16/2012 1525

Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method: Prep Method:

6010B

3010A

Analysis Date: Prep Date:

Dilution:

1.0

04/28/2012 0036 04/27/2012 0930 Analysis Batch: Prep Batch:

500-147970

500-147886

Instrument ID:

ICP6

Lab File ID:

P6042712C.asc

Initial Weight/Volume:

50 mL

Final Weight/Volume:

50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20	**************************************	0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.048		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00078	J	0.00054	0.0020
Calcium	61		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	39 5		0.024	0.10
Manganese	0.0032	j	0.0011	0.010
Nickel	0.0022	J	0.0019	0.010
Potassium	2.0		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	25 5		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	0.0090	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: Prep Method:

7470A 7470A 1.0

Analysis Date: Prep Date:

Dilution:

04/26/2012 1105 04/25/2012 1000 Analysis Batch: Prep Batch:

500-147745 500-147564

Instrument ID: Lab File ID:

HG6 042612R.CSV

Initial Weight/Volume: 25 mL Final Weight/Volume:

25 mL

MDL RL Qualifier Result (ug/L) Analyte 0.20 0.070 <0.20 UJ Mercury

orstala

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW362

Lab Sample ID:

500-45518-3

Client Matrix:

Water

Date Sampled: 04/16/2012 1600 Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Prep Batch:

Analysis Method: Prep Method:

6010B 3010A

1.0

Analysis Date: Prep Date:

Dilution:

04/28/2012 0109

04/27/2012 0930

Instrument ID: Analysis Batch: 500-147970

500-147886

Lab File ID:

ICP6

P6042712C.asc

Initial Weight/Volume: Final Weight/Volume:

50 mL 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	0.034	J	0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.041		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00098	J	0.00054	0.0020
Calcium	150		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	0.14	J	0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	89 J		0.024	0.10
Manganese	0.078		0.0011	0.010
Nickel	0.0042	J	0.0019	0.010
Potassium	5.8		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	200 5		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	<0.020		0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: Prep Method:

7470A 7470A

Analysis Date:

1.0 04/26/2012 1112

Prep Date:

Dilution:

04/25/2012 1000

Analysis Batch: Prep Batch:

500-147745 500-147564 Instrument ID: Lab File ID:

HG6 042612R.CSV

Initial Weight/Volume: 25 mL Final Weight/Volume:

25 mL

RL Qualifier MDL Result (ug/L) Analyte 0.20 0.070 <0.20 いて Mercury

CLSP24/12

Client: Toltest Inc. Job Number: 500-45518-1

Client Sample ID: JP-M13-GWMW999

 Lab Sample ID:
 500-45518-4
 Date Sampled: 04/16/2012 1200

 Client Matrix:
 Water
 Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method: 6010B Analysis Batch: 500-147970 Instrument ID: ICP6

Prep Method: 3010A Prep Batch: 500-147886 Lab File ID: P6042712C.asc

Dilution: 1.0 Initial Weight/Volume: 50 mL Analysis Date: 04/28/2012 0116 Final Weight/Volume: 50 mL

Prep Date: 04/27/2012 0930

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.042		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.0010	J	0.00054	0.0020
Calcium	150		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	0.38		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	93 🛨		0.024	0.10
Manganese	0.078		0.0011	0.010
Nickel	0.0063	J	0.0019	0.010
Potassium	6.0		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	210 5		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	0.011	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: 7470A Analysis Batch: 500-147745 Instrument ID: HG6

Prep Method: 7470A Prep Batch: 500-147564 Lab File ID: 042612R.CSV

Dilution: 1 0 Initial Weight/Volume: 25 mL

Dilution: 1.0 Initial Weight/Volume: 25 mL Analysis Date: 04/26/2012 1114 Final Weight/Volume: 25 mL

Analysis Date: 04/26/2012 1114 Final Weight/Volume: 25 mL Prep Date: 04/25/2012 1000

 Analyte
 Result (ug/L)
 Qualifier
 MDL
 RL

 Mercury
 <0.20 5</td>
 0.070
 0.20

ICP6

50 mL

50 mL

P6042712C.asc

Job Number: 500-45518-1 Client: Toltest Inc.

Client Sample ID: JP-M13-GWMW809

Date Sampled: 04/16/2012 1327 Lab Sample ID: 500-45518-5 Date Received: 04/17/2012 1230 Client Matrix: Water

500-147970

500-147886

Instrument ID:

Initial Weight/Volume:

Final Weight/Volume:

0.00062

0.0047

Instrument ID:

Initial Weight/Volume:

Final Weight/Volume:

Lab File ID:

Lab File ID:

6010B Metals (ICP)-Dissolved

Analysis Batch:

Prep Batch:

Analysis Method: 6010B

3010A Prep Method: Dilution: 1.0

Analysis Date:

Prep Date: 04/27/2012 0930

04/28/2012 0123

RL MDL Result (mg/L) Qualifier Analyte 0.025 0.20 0.028 Aluminum 0.0026 0.020 < 0.020 Antimony 0.0024 0.010 < 0.010 Arsenic 0.028 0.00044 0.010 Barium 0.00044 0.0040 < 0.0040 Beryllium J 0.00054 0.0020 0.00065 Cadmium 0.087 0.20 38 Calcium 0.00096 0.010 <0.010 Chromium < 0.0050 0.0010 0.0050 Cobalt 0.0011 0.010 < 0.010 Copper 0.070 0.20 0.094 J Iron <0.0050 0.0016 0.0050 Lead 0.024 0.10 29 て Magnesium 0.0011 0.010 0.0024 J Manganese 0.0044 0.0019 0.010 Nickel 0.070 0.50 Potassium 2.4 0.0027 0.010 < 0.010 Selenium 0.0011 0.0050 < 0.0050 Silver 0.12 1.0 19 2 Sodium <0.010 0.0013 0.010 Thallium

7470A Mercury (CVAA)-Dissolved

500-147745

500-147564

J

<0.0050

0.0073

Analysis Batch:

Prep Batch:

7470A Analysis Method: 7470A Prep Method:

Dilution: 1.0

Vanadium

Zinc

04/26/2012 1116 Analysis Date:

04/25/2012 1000 Prep Date:

MDL Qualifier

RL Result (ug/L) Analyte <0.20 US 0.070 0.20 Mercury

Page 68 of 846

CR5/24/12

0.0050

0.020

042612R.CSV

HG6

25 mL

25 mL

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW806

Lab Sample ID:

500-45518-6

Client Matrix:

Water

Date Sampled: 04/16/2012 1223

Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Batch:

Prep Batch:

Analysis Method: Prep Method:

6010B

3010A

Analysis Date: Prep Date:

Dilution:

1.0

04/28/2012 0127

04/27/2012 0930

Instrument ID: 500-147970

500-147886

ICP6

Lab File ID:

P6042712C.asc

Initial Weight/Volume:

50 mL

Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20	co. + No. 4 (4) (4) (4) (4) (4) (4) (4) (4) (4) (0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.082		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	0.00068	J	0.00054	0.0020
Calcium	68		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	<0.010		0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	40 5		0.024	0.10
Manganese	0.0024	J	0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	1.6		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	22 5		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	<0.0050		0.00062	0.0050
Zinc	0.013	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: Prep Method:

7470A 7470A 1.0

Analysis Date: Prep Date:

Dilution:

04/26/2012 1117 04/25/2012 1000 Analysis Batch: Prep Batch:

500-147745

500-147564

Instrument ID:

HG6

Lab File ID:

042612R.CSV

Initial Weight/Volume: 25 mL Final Weight/Volume:

25 mL

RL Analyte Result (ug/L) Qualifier MDL 0.20 <0.20 US 0.070 Mercury

CRS/W/12

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW807

Lab Sample ID:

500-45518-7

Client Matrix:

Water

Date Sampled: 04/16/2012 1127 Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method: 6010B Prep Method:

3010A 1.0

Analysis Date:

Dilution:

04/28/2012 0131

Prep Date:

04/27/2012 0930

Analysis Batch: Prep Batch:

Result (mg/L)

<0.20

<0.020

<0.010

<0.0040

0.00098

<0.0050

< 0.010

< 0.0050

0.0095

380

0.088

500-147970 500-147886

Lab File ID:

Qualifier

J

J

J

Instrument ID:

ICP6

P6042712C.asc

Initial Weight/Volume:

50 mL

RL

0.20

0.020

0.010

0.010

0.0040

0.0020

0.20

0.010

0.0050

0.010

0.0050

0.20

0.10

0.010

0.010

0.010

0.0050

0.010

0.0050

0.020

1.0

0.50

Final Weight/Volume:

MDL

0.025

0.0026

0.0024

0.00044

0.00044

0.00054

0.00096

0.0010

0.0011

0.070

0.0016

0.024

0.0011

0.0019

0.070

0.0027

0.0011

0.0013

0.0047

0.00062

0.12

0.087

50 mL

Analyte Aluminum Antimony

Arsenic Barium Beryllium Cadmium Calcium

Chromium Cobalt Copper Iron Lead Magnesium Manganese Nickel Potassium Selenium

Silver Sodium Thallium Vanadium Zinc

160 < 0.010 <0.0050 < 0.010 0.59 <0.0050 79 0.11 0.0025 7.2 < 0.010

7470A

7470A

04/26/2012 1119

04/25/2012 1000

1.0

7470A Mercury (CVAA)-Dissolved

Analysis Batch: Prep Batch:

500-147745 500-147564 Instrument ID:

HG6 042612R.CSV

Lab File ID: Initial Weight/Volume:

25 mL

Final Weight/Volume: 25 mL

Analyte Mercury

Dilution:

Analysis Method:

Prep Method:

Analysis Date: Prep Date:

> Result (ug/L) <0.20 VJ

Qualifier

MDL 0.070 RL 0.20

VIETH The sa	atory: <u>Test America, Inc.</u> IOD: Dissolved Metals (Eamples listed below were tion findings worksheets.	revie					•	ation find	Page:of Reviewer: 2nd Reviewer: dings are noted in attached
	Validation		Comments						
1.	Technical holding times			Α	Sampling	dates:	4-16-1	2	
II.	ICP/MS Tune			N	not	uti	lized		
111.	Calibration			Α					
IV.	Blanks			Α					
V.	ICP Interference Check San	nple (IC	S) Analysis	A				<u>. </u>	
VI.	Matrix Spike Analysis			SW	MS	MSI	>		
VII.	Duplicate Sample Analysis			Ą	DUP	1			
VIII.	Laboratory Control Samples	(LCS)		Α	LCS	<u> </u>			
IX.	Internal Standard (ICP-MS)			7	not	uti	lized		
X.	Furnace Atomic Absorption	QC		7	1,4		(1		
XI.	ICP Serial Dilution			A					
XII.	Sample Result Verification			N					
XIII.	Overall Assessment of Data			A					
XIV.	Field Duplicates			SW	D =	3+	4		
ΧV	Field Blanks			2					
Note: √alidate	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples: \$\alpha 11		R = Rins	o compound sate eld blank	ls detected		D = Duplicate TB = Trip blank EB = Equipment b	lank	
1	JP-M13-GWMW808	11			21			31	
	JP-M13-GWMW126R	12			22			32	
	JP-M13-GWMW362	13			23			33	
4	JP-M13-GWMW999	14			24			34	
5	JP-M13-GWMW809	15			25			35	
6	JP-M13-GWMW806	16			26			36	
7	JP-M13-GWMW807	17			27			37	
8	JP-M13-GWMW126RMS	18			28			38	

2

Notes:

29

30

39

JP-M13-GWMW126RMSD

JP-M13-GWMW126RDUP

19

PBW

LDC #: 27649A4

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page:_	of
Reviewer:	MG
2nd reviewer:	كرك

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1->7	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn) Mo, B, Si, CN ⁻ ,
QC 8-10	J.	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe. Pb. Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn) Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
I		Analysis Method
ICP	W	(Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mp) Hg (Ni, K, Se, Ag, Na, Tl, V, Zn) Mo, B, Si, CN ⁻ ,
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
GEAA		Al Sh As Ba Be Cd Ca Cr Co Cu Fe Ph Mg Mn Hg Ni K Se Ag Na Tl V 7n Mo B Si CN

Comments: Mercury by CVAA if performed	

LDC# 27649A4

VALIDATION FINDINGS WORKSHEET Matrix Spike/Matrix Spike Duplicates

Page: 1 of Reviewer: MG

METHOD: Trace metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

N N/A Was a matrix spike analyzed for each matrix in this SDG?

Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor Y (M) N/A

of 4 or more, no action was taken.

Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples? ON NA

LEVEL IV ONLY:

Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations. Y N N/A

Qualifications	J/U5/A		~										
Associated Samples	all		->										
RPD (Limits)													
MSD Wery %Recovery	(061-08) 01	76 ()	77 (🎍)										
MS %Recovery													
Analyte	Mg	Nby 0	Hq	0									
Matrix	Water		→										
MS/MSD ID	6/8		1										
#	_								Ы				

Comments:

LDC#: 27649 A4 VALIDATION FINDINGS WORKSHEET Field Duplicates

Reviewer: MG	-
2nd Reviewer:	_

METHOD: Metals (EPA Method 6010B/6020/7000)

NA NA YN NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentrat	ion (mg/L)	(≤25)	(mg/L)	(mg/L)	Qualifications
Analyte	3	4	RPD	Difference	Limits	(Parent Only)
Aluminum	0.034	0.20U		0.166	(≤0.40)	
Barium	0.041	0.042		0.001	(≤0.020)	
Cadmium	0.00098	0.0010		0.00002	(≤0.0040)	
Calcium	150	150	0			
Iron	0.14	0.38		0.24	(≤0.40)	
Magnesium	89	93	4			
Manganese	0.078	0.078	0			
Nickel	0.0042	0.0063		0.0021	(≤0.020)	
Potassium	5.8	6.0	3			
Sodium	200	210	5			
Zinc	0.020U	0.011		0.009	(≤0.040)	

V:\FIELD DUPLICATES\FD_inorganic\27649A4.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

JOAAP-GW

Collection Date:

April 16 2012

LDC Report Date:

May 23, 2012

Matrix:

Water

Parameters:

Wet Chemistry

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45518-1

Sample Identification

JP-M13-GWMW808

JP-M13-GWMW126R

JP-M13-GWMW362

JP-M13-GWMW999

JP-M13-GWMW809

JP-M13-GWMW806

JP-M13-GWMW807

JP-M13-GWMW126RMS

JP-M13-GWMW126RMSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Dissolved Sulfate and Dissolved Nitrate as Nitrogen.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
JP-M13-GWMW999	Nitrate as N	52.00 hours	48 hours	J (all detects) UJ (all non-detects)	P
JP-M13-GWMW809	Nitrate as N	50.75 hours	48 hours	J (all detects) UJ (all non-detects)	Р
JP-M13-GWMW806	Nitrate as N	52.25 hours	48 hours	J (all detects) UJ (all non-detects)	Р
JP-M13-GWMW807	Nitrate as N	54.00 hours	48 hours	J (all detects) UJ (all non-detects)	Р

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met

III. Calibration Verification

Calibration verification frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

Samples JP-M13-GWMW362 and JP-M13-GWMW999 were identified as field duplicates. No contaminant concentrations were detected in any of the samples with the following exceptions:

	Concentrat					
Analyte	JP-M13-GWMW362	JP-M13-GWMW999	RPD (Limits)	Difference (Limits)	Flags	A or P
Sulfate	270	270	0 (≤25)	-	-	-

JOAAP-GW Dissolved Sulfate - Data Qualification Summary - SDG 500-45518-1

SDG	Sample	Analyte	Flag	A or P	Reason
500-45518-1	JP-M13-GWMW999 JP-M13-GWMW809 JP-M13-GWMW806 JP-M13-GWMW807	Nitrate as N	J (all detects) UJ (all non-detects)	Р	Technical holding times

JOAAP-GW

Dissolved Sulfate - Laboratory Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

JOAAP-GW

Dissolved Sulfate - Field Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

Job Number: 500-45518-1

General Chemistry

Client Sample ID:

JP-M13-GWMW808

Lab Sample ID:

500-45518-1

Client Matrix:

Water

Date Sampled: 04/16/2012 1405

Date Received: 04/17/2012 1230

Result Qual Units MDL RL Dil Method Analyte <0.10 mg/L 0.023 0.10 1.0 300.0 Nitrate as N-Dissolved Analysis Batch: 500-146885 Analysis Date: 04/18/2012 1256 10 300.0 Sulfate-Dissolved 88 mg/L 0.90 2.0 Analysis Batch: 500-146885 Analysis Date: 04/18/2012 1311

CRS/24/12

Client: Toltest Inc. Job Number: 500-45518-1

General Chemistry

Client Sample ID:

JP-M13-GWMW126R

Lab Sample ID:

500-45518-2

Client Matrix:

Water

Date Sampled: 04/16/2012 1525

Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.13		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 5	00-146885	Analysis Date:	: 04/18/2	012 1325			
Sulfate-Dissolved	52		mg/L	0.90	2.0	10	300.0
Analysis Batch: 5	00-146885	Analysis Date:	: 04/18/2	012 1339			

CRSPURL

Job Number: 500-45518-1

General Chemistry

Client Sample ID:

JP-M13-GWMW362

Lab Sample ID: Client Matrix: 500-45518-3 Water Date Sampled: 04/16/2012 1600

Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolve	d <1.0		mg/L	0.23	1.0	10	300.0
An	alysis Batch: 500-146885	Analysis Date:	04/18/2	2012 1505			
Sulfate-Dissolved	270		mg/L	4.5	10	50	300.0
Ana	alysis Batch: 500-146885	Analysis Date:	04/19/2	2012 0358			

0R5/24/12

Job Number: 500-45518-1

General Chemistry

Client Sample ID:

JP-M13-GWMW999

Lab Sample ID: Client Matrix: 500-45518-4

Water

Date Sampled: 04/16/2012 1200

Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	<1.0 <i>US</i>	Н	mg/L	0.23	1.0	10	300.0
Analysis Batch: 50	00-146885 Analy	ysis Date	: 04/18/2	2012 1603			
Sulfate-Dissolved	270		mg/L	4.5	10	50	300.0
Analysis Batch: 50	00-146885 Analy	ysis Date:	: 04/19/2	012 0413			

ORSPUR

Job Number: 500-45518-1

General Chemistry

Client Sample ID:

JP-M13-GWMW809

Lab Sample ID: Client Matrix:

500-45518-5 Water

Date Sampled: 04/16/2012 1327

Date Received: 04/17/2012 1230

MDL RL Dil Method Qual Units Analyte Result 1.0 300.0 0.13 🕥 0.023 0.10 Nitrate as N-Dissolved Ή mg/L Analysis Batch: 500-146885 Analysis Date: 04/18/2012 1617 0.090 0.20 1.0 300.0 mg/L Sulfate-Dissolved 5.4

Analysis Batch: 500-146885 Analysis Date: 04/18/2012 1617

025/24/12

Analytical Data

Client: Toltest Inc.

Job Number: 500-45518-1

General Chemistry

Client Sample ID:

JP-M13-GWMW806

Lab Sample ID:

500-45518-6 Water

Client Matrix:

Date Sampled: 04/16/2012 1223

Date Received: 04/17/2012 1230

MDL RLDil Method Units Result Qual Analyte 1.0 300.0 H 0.023 0.10 Nitrate as N-Dissolved 0.39 🔿 mg/L Analysis Batch: 500-146885 Analysis Date: 04/18/2012 1645 0.90 2.0 10 300.0 mg/L Sulfate-Dissolved 80

Analysis Batch: 500-146885 Analysis Date: 04/18/2012 1700

025/24/12

Client: Toltest Inc. Job Number: 500-45518-1

General Chemistry

Client Sample ID:

JP-M13-GWMW807

Lab Sample ID: Client Matrix:

500-45518-7

Water

Date Sampled: 04/16/2012 1127

Date Received: 04/17/2012 1230

Qual Units MDL RL Dil Method Result Analyte <1.0 05 0.23 1.0 10 300.0 Nitrate as N-Dissolved H mg/L Analysis Batch: 500-146885 Analysis Date: 04/18/2012 1728 Sulfate-Dissolved 230 mg/L 4.5 10 50 300.0 Analysis Batch: 500-146885 Analysis Date: 04/19/2012 0427

0RS/24/12

SDG#	t: 27649A6 t: 500-45518-1 atory: <u>Test America, Inc.</u>	_	IOITADI.	_	PLETENI Level III	ESS WOR	KSHEET	Date: 5-17- Page: 1 of 1 Reviewer: MG 2nd Reviewer:
	IOD: Dissolved Nitrate-N			•		•		
	amples listed below were tion findings worksheets.		ved for eac	ch of the fo	ollowing va	alidation area	s. Validation findin	gs are noted in attached
	Validation	Area					Comments	
1.	Technical holding times			SW	Sampling d	lates: 4 –	16-12	
11	Initial calibration			A				
111.	Calibration verification			A				
IV	Blanks			A				
V	Matrix Spike/Matrix Spike Du	uplicates	s	A	MS/M	1SD		
VI.	Duplicates			7				
VII.	Laboratory control samples			A	LCS			
VIII.	Sample result verification			N			····	
IX.	Overall assessment of data			Α				···.
X	Field duplicates			SW	D=	3+4	·	
LxL	Field blanks			N				
Note:	A = Acceptable N = Not provided/applicable SW = See worksheet	;	R = Rins	o compound sate eld blank	Is detected	D = Dup TB = Tr EB = Ed		
Validate	ed Samples: all water						· · · · · · · · · · · · · · · · · · ·	
1 .	JP-M13-GWMW808	11			21		31	
2 .	JP-M13-GWMW126R	12			22		32	
3 .	JP-M13-GWMW362	13			23		33	
4 .	JP-M13-GWMW999	14			24		34	
5	JP-M13-GWMW809	15			25		35	

7	JP-M13-GWMW807	17		27	37	
8	JP-M13-GWMW126RMS	18		28	38	
9	JP-M13-GWMW126RMSD	19		29	39	
10		20	PBW	30	40	

26

JP-M13-GWMW806

16

LDC#: 27649A6

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	l_of
Reviewer:	MG
2nd reviewer:	<u>\</u>

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1->7	W	pH TDS CI F(NO3)NO2 (SO4) PO4 ALK CN NH3 TKN TOC CR6+ CIO4
ac 8,9		pH TDS CI F(NO3)NO, SOJ PO4 ALK CN- NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		PH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
	:	PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		ph tds ci f no3 no2 so4 po4 alk cn nh3 tkn toc cr6+ cio4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		PH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ ClO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CLF NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR8+ ClO4
		pH TDS CLE NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+ CIO,

Comments:			
	, , , , , , , , , , , , , , , , , , ,		
		·	

LDC#: 27649 A 6

VALIDATION FINDINGS WORKSHEET Technical Holding Times

Page:_	1_of_1_
Reviewer:	
2nd reviewer:	

All circled dates have exceeded the technical holding time.

N N/A

Were all samples preserved as applicable to each method?

N N/A Were all coole	er temperatures	within validation	criteria?				
Method:		300.0					
Parameters:		N03-N					
Technical holding tir	me:	48 hr					
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
4	(3:00	(6:03	/				J/UJ/P
5	4-16-12 13:27 4-16-12	4-18-12 16:17 4-18-12	(50.75)				10/00/1
6	4-16-12 12:23 4-16-12	16:45	(52.25)				
7	4-16-12 11:27 4-16-12	17:28	(54.00)				
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LDC#: 27649 A

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: I of I
Reviewer: MG
2nd Reviewer:

Inorganics, Method 300.0

	Concentrat	tion (mg/L)				
Analyte	3	4	RPD (≤25)	Difference	Limits	Qualification (Parent only)
Sulfate	270	270	0			_

V:\FIELD DUPLICATES\FD_inorganic\27649A6.wpd

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

JOAAP-GW

Collection Date:

April 16, 2012

LDC Report Date:

May 25, 2012

Matrix:

Water

Parameters:

Explosives

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45518-1

Sample Identification

JP-M13-GWMW808

JP-M13-GWMW126R

JP-M13-GWMW362

JP-M13-GWMW999

JP-M13-GWMW809

JP-M13-GWMW806

JP-M13-GWMW807

JP-M13-GWMW126RMS

JP-M13-GWMW126RMSD

Introduction

This data review covers 9 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Column	Compound	%D	Associated Samples	Flag	A or P
4/20/12	L3uPH	2,4,6-Trinitrotoluene	16.6	JP-M13-GWMW807	J (all detects) UJ (all non-detects)	А

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation and RLs

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
JP-M13-GWMW362	2-Nitrotoluene	79.0	J (all detects)	А

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

Samples JP-M13-GWMW362 and JP-M13-GWMW999 were identified as field duplicates. No explosives were detected in any of the samples with the following exceptions:

	Concentra					
Compound	JP-M13-GWMW362	JP-M13-GWMW362 JP-M13-GWMW999		Difference (Limits)	Flags	A or P
2,4,6-Trinitrotoluene	0.073	0.097	-	0.024 (≤0.80)	-	-
2,4-Dinitrotoluene	4.9	5.4	10 (≤25)	-	-	-
2-Amino-4,6-dinitrotoluene	1.2	1.2	-	0 (≤1.55)	-	-
4-Amino-2,6-dinitrotoluene	1.1	1.0	-	0.1 (≤1.55)	-	-
2-Nitrotoluene	0.24	2.0		1.76 (≤0.80)	J (all detects)	А

	Concentration (ug/L)					
Compound	JP-M13-GWMW362	JP-M13-GWMW999	RPD (Limits)	Difference (Limits)	Flags	A or P
4-Nitrotoluene	0.31U	1.9	-	1.59 (≤0.80)	J (all detects) UJ (all non-detects)	Α
3-Nitrotoluene	0.31U	0.19	_	0.12 (≤0.80)	-	-

JOAAP-GW Explosives - Data Qualification Summary - SDG 500-45518-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45518-1	JP-M13-GWMW807	2,4,6-Trinitrotoluene	J (all detects) UJ (all non-detects)	А	Continuing calibration (%D)
500-45518-1	JP-M13-GWMW362	2-Nitrotoluene	J (all detects)	А	Compound quantitation and RLs (%D)
500-45518-1	JP-M13-GWMW362 JP-M13-GWMW999	2-Nitrotoluene	J (all detects)	А	Field duplicates (difference)
500-45518-1	JP-M13-GWMW362 JP-M13-GWMW999	4-Nitrotoluene	J (all detects) UJ (all non-detects)	Α	Field duplicates (difference)

JOAAP-GW

Explosives - Laboratory Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

JOAAP-GW

Explosives - Field Blank Data Qualification Summary - SDG 500-45518-1

No Sample Data Qualified in this SDG

Analytical Data

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW808

Lab Sample ID:

Analysis Date:

500-45518-1

04/20/2012 1413

Client Matrix:

Water

Date Sampled: 04/16/2012 1405 Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: 8330 Prep Method: 3535 Dilution: 1.0

Analysis Batch: Prep Batch:

500-146863 500-147010 Instrument ID:

INST39-40 Initial Weight/Volume: 770 mL

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

Result Type:

PRIMARY

Prep Date: 04/19/2012 2030		Resu	ılt Type:	PRIMARY
Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31	**************************************	0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2.6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Acce	otance Limits
1,2-Dinitrobenzene	98	**************************************	70 - 1	30

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW126R

Lab Sample ID:

500-45518-2

Client Matrix:

Water

Date Sampled: 04/16/2012 1525

Date Received: 04/17/2012 1230

Analysis Method: Prep Method:

8330 3535 Analysis Batch: Prep Batch:

500-146863

Instrument ID:

INST39-40 Initial Weight/Volume: 770 mL

Dilution: Analysis Date: 1.0

500-147010

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

04/20/2012 1505

Prep Date:	04/19/2012 2030		Resu	ılt Type:	PRIMARY
Analyte		Result (ug/L)	Qualifier	MDL	RL
HMX		<0.31	ter (1900) etter (1 <mark>46), den gemengen den erstelle heter kommende e</mark> n gegen jarren.	0.12	0.31
RDX		<0.16		0.077	0.16
1,3,5-Trinitrobe	enzene	<0.16		0.039	0.16
1,3-Dinitrobenz	zene	<0.16		0.033	0.16
Nitrobenzene		<0.16		0.032	0.16
2,4,6-Trinitroto	luene	<0.16		0.036	0.16
Tetryl		<0.39		0.065	0.39
2,4-Dinitrotolue	ene	<0.31		0.032	0.31
2,6-Dinitrotolue	ene	<0.31		0.071	0.31
2-Amino-4,6-di	initrotoluene	<0.31		0.035	0.31
4-Amino-2,6-di	initrotoluene	<0.31		0.074	0.31
2-Nitrotoluene		0.35		0.082	0.31
4-Nitrotoluene		0.30	J	0.082	0.31
3-Nitrotoluene		<0.31		0.14	0.31
Surrogate		%Rec	Qualifier	Acce	otance Limits
1,2-Dinitrobenz	zene	112	terrer de alle en reconsectamente de en en en en en en en en en en en en en	70 - 1	30

Analytical Data

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW362

Lab Sample ID:

500-45518-3

Client Matrix:

Water

Date Sampled: 04/16/2012 1600

Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines ((HPLC)	
--------------------------------------	--------	--

Analysis Method: 8330 Prep Method: 3535 Dilution:

1.0

Analysis Date: Prep Date:

04/20/2012 1740 04/19/2012 2030 Analysis Batch: 500-146863 Prep Batch:

500-147010

Instrument ID:

Initial Weight/Volume: 770 mL Final Weight/Volume:

INST39-40 6.0 mL

Injection Volume: Result Type:

100 uL **PRIMARY**

Analyte	Result (ug/L)	Qualifier	MDL	RL	
HMX	<0.31	***************************************	0.12	0.31	sommers of the second
RDX	<0.16		0.077	0.16	
1,3,5-Trinitrobenzene	<0.16		0.039	0.16	
1,3-Dinitrobenzene	<0.16		0.033	0.16	
Nitrobenzene	<0.16		0.032	0.16	
2,4,6-Trinitrotoluene	0.073	J	0.036	0.16	
Tetryl	<0.39		0.065	0.39	
2,4-Dinitrotoluene	4.9		0.032	0.31	
2,6-Dinitrotoluene	<0.31		0.071	0.31	
2-Amino-4,6-dinitrotoluene	1.2		0.035	0.31	
4-Amino-2,6-dinitrotoluene	1.1		0.074	0.31	
2-Nitrotoluene	0.24 3	J	0.082	0.31	
4-Nitrotoluene	<0.31 仏 う		0.082	0.31	
3-Nitrotoluene	<0.31		0.14	0.31	
Surrogate	%Rec	Qualifier	Accep	otance Limits	
1,2-Dinitrobenzene	105	***************************************	70 - 1	30	AND AND AND AND AND AND AND AND AND AND

025/36/12

Analytical Data

Client: Toltest Inc.

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW999

Lab Sample ID:

500-45518-4

Client Matrix:

Prep Date:

Water

Date Sampled: 04/16/2012 1200

Date Received: 04/17/2012 1230

Analysis Method: Prep Method: Dilution:

1,2-Dinitrobenzene

8330 3535 1.0

Analysis Batch: Prep Batch:

500-146863 500-147010 Instrument ID:

INST39-40 770 mL Initial Weight/Volume:

70 - 130

Final Weight/Volume: Injection Volume: Result Type:

6.0 mL 100 uL **PRIMARY**

Analysis Date: 04/20/2012 1831 04/19/2012 2030

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	0.097	J	0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	5.4		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4,6-dinitrotoluene	1.2		0.035	0.31
4-Amino-2,6-dinitrotoluene	1.0		0.074	0.31
2-Nitrotoluene	2.0 5		0.082	0.31
4-Nitrotoluene	1.9 5		0.082	0.31
3-Nitrotoluene	0.19	J	0.14	0.31
Surrogate	%Rec	Qualifier	Accepta	ince Limits

109

Ces/30/12

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW809

Lab Sample ID:

Analysis Date:

500-45518-5

Client Matrix:

Water

Date Sampled: 04/16/2012 1327

Date Received: 04/17/2012 1230

Analysis Method: 8330 Prep Method: Dilution:

3535

1.0 04/20/2012 1923 Prep Batch:

Analysis Batch: 500-146863 500-147010

Instrument ID:

Initial Weight/Volume: 770 mL

INST39-40

Final Weight/Volume: 6.0 mL Injection Volume:

100 uL

Prep Date:	04/19/2012 2030		•	ilt Type:	PRIMARY
Analyte		Result (ug/L)	Qualifier	MDL	RL
HMX		<0.31	**************************************	0.12	0.31
RDX		<0.16		0.077	0.16
1,3,5-Trinitrobenz	zene	<0.16		0.039	0.16
1,3-Dinitrobenzer	ne	<0.16		0.033	0.16
Nitrobenzene		<0.16		0.032	0.16
2,4,6-Trinitrotolue	ene	<0.16		0.036	0.16
Tetryl		<0.39		0.065	0.39
2,4-Dinitrotoluene	• •	<0.31		0.032	0.31
2,6-Dinitrotoluene	e	<0.31		0.071	0.31
2-Amino-4,6-dinit	rotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinit	rotoluene	<0.31		0.074	0.31
2-Nitrotoluene		<0.31		0.082	0.31
4-Nitrotoluene		<0.31		0.082	0.31
3-Nitrotoluene		<0.31		0.14	0.31
Surrogate		%Rec	Qualifier	Accept	tance Limits
1,2-Dinitrobenzer	ne	107	***************************************	70 - 13	30

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW806

Lab Sample ID:

500-45518-6

04/20/2012 2015

Client Matrix:

Analysis Date:

Water

Date Sampled: 04/16/2012 1223

Date Received: 04/17/2012 1230

8330 Nitroaromatics	and Nitramines ((HPLC)
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Analysis Method: 8330 Prep Method: 3535 Dilution: 1.0

Prep Batch:

Analysis Batch: 500-146863 500-147010

Instrument ID:

Initial Weight/Volume: 770 mL

INST39-40

Final Weight/Volume: 6.0 mL Injection Volume:

100 uL

Prep Date:	04/19/2012 2030		Resu	ılt Type:	PRIMARY
Analyte		Result (ug/L)	Qualifier	MDL	RL
HMX		<0.31	***************************************	0.12	0.31
RDX		<0.16		0.077	0.16
1,3,5-Trinitrobe	enzene	<0.16		0.039	0.16
1,3-Dinitrobenz	ene	<0.16		0.033	0.16
Nitrobenzene		<0.16		0.032	0.16
2,4,6-Trinitroto	luene	<0.16		0.036	0.16
Tetryl		<0.39		0.065	0.39
2,4-Dinitrotolue	ene	<0.31		0.032	0.31
2,6-Dinitrotolue	ene	<0.31		0.071	0.31
2-Amino-4,6-di	nitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-di	nitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene		<0.31		0.082	0.31
4-Nitrotoluene		<0.31		0.082	0.31
3-Nitrotoluene		<0.31		0.14	0.31
Surrogate		%Rec	Qualifier	Accep	otance Limits
1,2-Dinitrobenz	zene	108		70 - 1	30

Job Number: 500-45518-1

Client Sample ID:

JP-M13-GWMW807

Lab Sample ID:

500-45518-7

04/20/2012 2158

Client Matrix:

Water

Date Sampled: 04/16/2012 1127

Date Received: 04/17/2012 1230

8330 Nitroaromatics	and Nitramines	(HPLC)
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Analysis Method: 8330 Prep Method: Dilution:

Analysis Date:

3535 1.0

Prep Batch:

Analysis Batch: 500-146863 500-147010

Instrument ID:

INST39-40 Initial Weight/Volume: 770 mL

Final Weight/Volume: 6.0 mL

Injection Volume:

100 uL

Prep Date:	04/19/2012 2030		•	ult Type:	PRIMARY
Analyte		Result (ug/L)	Qualifier	MDL	RL
HMX		<0.31	********************************	0.12	0.31
RDX	•	<0.16		0.077	0.16
1,3,5-Trinitroben	zene	<0.16		0.039	0.16
1,3-Dinitrobenze	ne	<0.16		0.033	0.16
Nitrobenzene		<0.16		0.032	0.16
2,4,6-Trinitrotolu	ene	<0.16 US		0.036	0.16
Tetryl		<0.39		0.065	0.39
2,4-Dinitrotoluen	e	<0.31		0.032	0.31
2,6-Dinitrotoluen	e	<0.31		0.071	0.31
2-Amino-4,6-dini	trotoluene	<0.31		0.035	0.31
4-Amino-2,6-dini	trotoluene	<0.31		0.074	0.31
2-Nitrotoluene		<0.31		0.082	0.31
4-Nitrotoluene		<0.31		0.082	0.31
3-Nitrotoluene		<0.31		0.14	0.31
Surrogate		%Rec	Qualifier	Accept	ance Limits
1,2-Dinitrobenze	ne	108		70 - 13	10

LDC #: 27649A40	VALIDATION COMPLETENESS WORKSHEET	Date: 5/22/12
SDG #: 500-45518-1	Level III	Page: <u></u> \ of <u>1</u>
Laboratory: Test America, Inc.		Reviewer: A
		2nd Reviewer

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
1.	Technical holding times	A	Sampling dates: 4/10/12
-11	Initial calibration	A	1. RSD = 201.
111.	Calibration verification/ICV	SWA	1-D = 151. , 100/cov
IV.	Blanks	A	, '
V	Surrogate recovery	A	
VI.	Matrix spike/Matrix spike duplicates	A	ms/D
VII.	Laboratory control samples	ASW	LCS
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	SWX	
X.	System Performance	N	
XI.	Overall assessment of data	A	
XII.	Field duplicates	SW	FD= 3,4
XIII.	Field blanks	N	,

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate FB = Field blank

D = Duplicate

TB = Trip blank
EB = Equipment blank

Validated Samples:

1	JP-M13-GWMW808	11	147010 MB	21	31	
2	JP-M13-GWMW126R	12		22	32	
3	JP-M13-GWMW362	13_		23	33	
4	JP-M13-GWMW999	14		24	34	
5	JP-M13-GWMW809	15		25	35	
6	JP-M13-GWMW806	16		26	36	
7	JP-M13-GWMW807	17		27	37	
8	JP-M13-GWMW126RMS	18		28	38	
9	JP-M13-GWMW126RMSD	19		29	39	
10		20		30	40	

Notes:	 	

VALIDATION FINDINGS WORKSHEET

METHOD: GC /HPL

8310	8330	8151	8141	8141(Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
i. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotoluene	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Famphur	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Phosmet	
O. Phenanthrene	O. Nitroglycerin		O. Chlorpyrifos	JJ. Tetrachlorvinphos	
P. Pyrene	P.		P. Fenthion	KK. Demeton (total)	
Ċ	Ö		Q. Parathion-ethyl		
Ÿ.			R. Trichlornate		
Š			S. Merphos		
		-	T. Stirofos		
			U. Tokuthion		

Notes:

LDC# 4-640 A70

VALIDATION FINDINGS WORKSHEET Continuing Calibration

Page: of

2nd Reviewer: Reviewer:_

METHOD: __GC__HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y **(()** N/A Level IX-Only Y N **((/) ()**

Were the retention times for all calibrated compounds within their respective acceptance windows?

Qualifications	T/UT/4																	
Associated Samples	1+						agrada and a sample of the sam						7.000					
RT (limit)	()		.)	()	()	()	()	()	()	()	(
%D S. O (Limit ≤ 20.9)	16.6										-							
Compound		-																
Detector/ Columb	13mPH																	
Standard ID	4/20/12 OHOUR 18	04061240-180.1																
	4/20/12	-																
#																		

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Compound Quantitation and Reported CRQLs VALIDATION FINDINGS WORKSHEET

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Page: _(_of_) 2nd

> GC HPLC METHOD:

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Level IVID Only

Y N N/A

Y N N/A Y N N/A

Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Did the reported results for detected target compounds agree within 10.0% of the recalculated results? Did the percent difference of detected compounds between two columns./detectors <40%?

If no, please see findings bellow.

Qualifications	I/A 204.								
%D Between Two Columns/Detectors Limit (≤ 40%)	74.0								
Sample ID	3								
Compound Name	7								
#									

Comments:

LDC#: 27649440

VALIDATION FINDINGS WORKSHEET Field Duplicates

Page: ___of __ Reviewer: _AA 2nd Reviewer: _CC

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

YN NA YN NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentration (ug/L)		(s 25)	(ug/L)	Qualifications
Analyte	3	4	RPD	Difference	(Parent Only)
G	0.073	0.097		(limit ± 0.80)	No Qual.
J	4.9	5.4	10		
I	1-2	1.2	#	(± 1.55) 0	
H	1-1	1.0		0.1 (£1.55)	
L	0.24	2.0		1.76 (40.80)	J/A duts.
N	0.31 U	1-9		1.59 (40.80)	* Tula

Concentrati	on (uall)	(≤ 25)	(ug/L)		Qualifications
3	4	RPD	Difference		(Parent Only)
0.31 U	0.19 1.9		0.12 (=0.80)		No Qual.
	3	0.19	3 4 RPD	3 4 RPD Diffe	3 H RPD Difference

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

JOAAP-GW

Collection Date:

April 16, 2012

LDC Report Date:

May 24, 2012

Matrix:

Water

Parameters:

Volatiles

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45519-1

Sample Identification

JP-M11-GWMW802

JP-M11-GWMW805

JP-M11-GWMW335

JP-M11-GWMW336

JP-Tripblank-0412

Introduction

This data review covers 5 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds.

The percent difference (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
4/20/12	Isopropylbenzene	20.4	All samples in SDG 500-45519-1	J (all detects) UJ (all non-detects)	А

All of the continuing calibration relative response factors (RRF) for were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

Sample JP-Tripblank-0412 was identified as a trip blank. No volatile contaminants were found.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW

Volatiles - Data Qualification Summary - SDG 500-45519-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45519-1	JP-M11-GWMW802 JP-M11-GWMW805 JP-M11-GWMW335 JP-M11-GWMW336 JP-Tripblank-0412	Isopropylbenzene	J (all detects) UJ (all non-detects)	А	Continuing calibration (ICV %D)

JOAAP-GW

Volatiles - Laboratory Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

JOAAP-GW

Volatiles - Field Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

Analytical Data

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW802

Lab Sample ID:

500-45519-2

Client Matrix:

Water

Date Sampled: 04/16/2012 1140

Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B Prep Method:

5030B

Analysis Batch: 500-147778

Instrument ID:

CMS19

Dilution:

1.0

Prep Batch:

N/A

Lab File ID: Initial Weight/Volume: 5 mL

45519-02.D

Analysis Date:

04/27/2012 0436

Final Weight/Volume:

5 mL

-	
Prep	Date:

04/27/2012 0436

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0	000000 0000000000000000000000000000000	1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0 1.0
1,2-Dichloroethane	<1.0		0.28 0.29	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.30	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.25	1.0
1,1-Dichloropropene	<1.0		0.28	1.0
cis-1,3-Dichloropropene	<1.0		0.35	1.0
trans-1,3-Dichloropropene	<1.0 <1.0		0.14	1.0
Ethylbenzene	< 1.0 < 5.0		0.56	5.0
2-Hexanone	<1.0		0.45	1.0
Hexachlorobutadiene	<1.0 <1.0 US		0.43	1.0
Isopropylbenzene	<1.0 03		0.24	1.0
p-Isopropyltoluene	<3.0		0.63	3.0
Methylene Chloride	<5.0 <5.0		0.79	5.0
4-Methyl-2-pentanone (MIBK)	~ J.U		5.70	2.0

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CRS/30/12

05/08/2012

Job Number: 500-45519-1 Client: Toltest Inc.

JP-M11-GWMW802 Client Sample ID:

Lab Sample ID: 500-45519-2

Date Sampled: 04/16/2012 1140 Date Received: 04/17/2012 1230 Water Client Matrix:

8260B VOC

CMS19 Analysis Batch: 500-147778 Instrument ID: Analysis Method: 8260B Prep Batch: N/A Lab File ID: 45519-02.D Prep Method: 5030B

Initial Weight/Volume: 5 mL Dilution: 1.0

Final Weight/Volume: 5 mL Analysis Date: 04/27/2012 0436 Prep Date: 04/27/2012 0436

Trop Bate.				
Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0	**************************************	0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachioroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0
Surrogate	%Rec	Qualifier	Accept	ance Limits
	93		75 - 12	AND THE PROPERTY OF THE PROPER
4-Bromofluorobenzene (Surr) Dibromofluoromethane	101		85 - 11	=
	98		70 - 12	
1,2-Dichloroethane-d4 (Surr)	102		85 - 12	-
Toluene-d8 (Surr)	102		00 - 12	0

Analytical Data

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW805

Lab Sample ID:

500-45519-3

Client Matrix:

Water

Date Sampled: 04/16/2012 1235

Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: Prep Method:

8260B 5030B Prep Batch:

Analysis Batch: 500-147778 N/A

Instrument ID: Lab File ID:

CMS19 45519-03.D

Dilution:

1.0

Initial Weight/Volume: 5 mL

Analysis Date:

04/27/2012 0500

Final Weight/Volume: 5 mL

0.25

0.28

0.35

0.14

0.56

0.45

0.21

0.24

0.63

0.79

Allalysis Date. 04/2/12012 0000		Tinal troight volume.			
Prep Date: 04/27/2012 0500					
Analyte	Result (ug/L)	Qualifier	MDL	RL	
Acetone	<5.0		1.9	5.0	
Benzene	<1.0		0.12	1.0	
Bromobenzene	<1.0		0.31	1.0	
Bromochioromethane	<1.0		0.50	1.0	
Bromodichloromethane	<1.0		0.23	1.0	
Bromoform	<1.0		0.45	1.0	
Bromomethane	<1.4		0.49	1.4	
2-Butanone (MEK)	<5.0		1.0	5.0	
n-Butylbenzene	<1.0		0.21	1.0	
sec-Butylbenzene	<1.0		0.19	1.0	
tert-Butylbenzene	<1.0		0.24	1.0	
Carbon disulfide	<5.0		0.44	5.0	
Carbon tetrachloride	<1.0		0.28	1.0	
Chlorobenzene	<1.0		0.24	1.0	
Dibromochloromethane	<1.0		0.25	1.0	
Chloroethane	<1.4		0.33	1.4	
Chloroform	<1.0		0.25	1.0	
Chloromethane	<1.0		0.24	1.0	
2-Chlorotoluene	<1.0		0.21	1.0	
Vinyl acetate	<2.0		0.48	2.0	
4-Chlorotoluene	<1.0		0.21	1.0	
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6	
1,2-Dibromoethane	<1.0		0.45	1.0	
Dibromomethane	<1.0		0.39	1.0	
1,2-Dichlorobenzene	<1.0		0.21	1.0	
1,3-Dichlorobenzene	<1.0		0.26	1.0	
1,4-Dichlorobenzene	<1.0		0.24	1.0	
Dichlorodifluoromethane	<1.0		0.26	1.0	
1,1-Dichloroethane	<1.0		0.24	1.0	
1,2-Dichloroethane	<1.0		0.28	1.0	
1,1-Dichloroethene	<1.0		0.29	1.0	
cis-1,2-Dichloroethene	<1.0		0.22	1.0	
trans-1,2-Dichloroethene	<1.0		0.27	1.0	
1,2-Dichloropropane	<1.0		0.36	1.0	
1,3-Dichloropropane	<1.0		0.27	1.0	
2,2-Dichloropropane	<1.0		0.31	1.0	
•			0.05	4.0	

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4-Methyl-2-pentanone (MIBK)

1,1-Dichloropropene

Hexachlorobutadiene

Isopropylbenzene

p-Isopropyltoluene

Methylene Chloride

Ethylbenzene

2-Hexanone

cis-1,3-Dichloropropene

trans-1,3-Dichloropropene

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<1.0

<1.0

<1.0

<1.0

<5.0

<1.0

<1.0

<3.0

<5.0

<1.0 05

5.0 05/30/12 05/08/2012

1.0

1.0

1.0

1.0

5.0

1.0

1.0

1.0

3.0

Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW805

Lab Sample ID:

500-45519-3

Client Matrix:

Water

Date Sampled: 04/16/2012 1235

Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B Prep Method:

5030B

Analysis Batch: 500-147778

Instrument ID:

CMS19

Dilution:

1.0

Prep Batch:

N/A

Lab File ID:

45519-03.D

Analysis Date:

04/27/2012 0500

Prep Date:

04/27/2012 0500

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Result (ug/L)	Qualifier	MDL	RL
<1.0	engang natural servang nerang natura servang natura seria seria seria seria seria seria seria seria seria seri	0.28	1.0
<1.0		0.24	1.0
<1.0		0.19	1.0
<1.0		0.26	1.0
<1.0		0.31	1.0
<1.0		0.35	1.0
<1.0		0.22	1.0
<1.0		0.15	1.0
<1.0		0.36	1.0
<1.0		0.22	1.0
<1.0		0.26	1.0
<1.0		0.30	1.0
<1.0		0.18	1.0
		0.22	1.0
<1.2		0.60	1.2
<1.0		0.22	1.0
<1.0		0.23	1.0
<1.0		0.13	1.0
<1.0		0.13	1.0
		0.30	2.0
<1.0		0.30	1.0
%Rec	Qualifier		ance Limits
93	en angla - year - ye rmi sa digili da sangangan kanasa kanasa sa manasa di Salah in in in indonésia d i	75 - 12	
95		85 - 11:	5
	<1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	<1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0 <1.0	<1.0

99

99

70 - 120

85 - 120

1,2-Dichloroethane-d4 (Surr)

Toluene-d8 (Surr)

Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW335

Lab Sample ID:

500-45519-4

Client Matrix:

Water

Date Sampled: 04/16/2012 1325

Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B Prep Method:

5030B

Analysis Batch: 500-147778

Instrument ID:

CMS19

Dilution:

1.0

Prep Batch:

N/A

Lab File ID: Initial Weight/Volume: 5 mL

45519-04.D

Analysis Date: Prep Date:

04/27/2012 0523 04/27/2012 0523 Final Weight/Volume: 5 mL

Result (ug/L) Qualifier

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chiorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0 1.0
trans-1,2-Dichloroethene	<1.0		0.27	
1,2-Dichloropropane	<1.0		0.36 0.27	1.0 1.0
1,3-Dichloropropane	<1.0			1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.1 4 0.56	5.0
2-Hexanone	<5.0			1.0
Hexachlorobutadiene	<1.0		0.45 0.21	1.0
Isopropylbenzene	<1.0 US		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	3.0
Methylene Chloride	<3.0		0.63	5.0 5.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.18	5.0

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OS/2012

Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW335

Lab Sample ID:

500-45519-4

Client Matrix:

Water

Date Sampled: 04/16/2012 1325 Date Received: 04/17/2012 1230

8260B VOC

Analysis Method:

8260B 5030B

Analysis Batch: 500-147778

Instrument ID:

CMS19

Prep Method:

Prep Batch:

N/A

Lab File ID:

45519-04.D

Dilution:

1.0

Initial Weight/Volume: 5 mL

Analysis Date:

04/27/2012 0523

Final Weight/Volume: 5 mL

,	
Prep	Date:

04/27/2012 0523

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	90		75 - 120
Dibromofluoromethane	94		85 - 115
1,2-Dichloroethane-d4 (Surr)	96		70 - 120
Toluene-d8 (Surr)	98		85 - 120

05/30/12 05/08/2012

Analytical Data

Job Number: 500-45519-1 Client: Toltest Inc.

Client Sample ID:

JP-M11-GWMW336

Lab Sample ID: Client Matrix:

500-45519-5

Water

Date Sampled: 04/16/2012 1410 Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B Prep Method:

5030B

Prep Batch:

Analysis Batch: 500-147778 N/A

Instrument ID: Lab File ID:

CMS19 45519-05.D

Dilution: Analysis Date: 1.0

04/27/2012 0546

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Prep Date:

04/27/2012 0546

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0	nen e e estado en estado estado en estado en entre en estado en estado en el como en entre en el como en entre	1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1,2-Dichlorobenzene	<1.0		0.21	1.0
1,3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0 1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1,1-Dichloroethane	<1.0		0.2 4 0.28	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0 <1.0		0.22	1.0
trans-1,2-Dichloroethene	***		0.36	1.0
1,2-Dichloropropane	<1.0 <1.0		0.30	1.0
1,3-Dichloropropane			0.27	1.0
2,2-Dichloropropane	<1.0 <1.0		0.25	1.0
1,1-Dichloropropene	<1.0		0.28	1.0
cis-1,3-Dichloropropene	<1.0		0.35	1.0
trans-1,3-Dichloropropene	<1.0		0.14	1.0
Ethylbenzene	<5.0		0.56	5.0
2-Hexanone	<1.0		0.45	1.0
Hexachlorobutadiene	<1.0 U 5		0.21	1.0
Isopropylbenzene	<1.0		0.24	1.0
p-IsopropyItoluene Methylene Chloride	<3.0		0.63	3.0
	<5.0 <5.0		0.79	5.0
4-Methyl-2-pentanone (MIBK)	0.0		= · · · ·	

TestAmerica Chicago

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OS/30/12 05/08/2012

Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW336

Lab Sample ID:

500-45519-5

Client Matrix:

Water

Date Sampled: 04/16/2012 1410

Date Received: 04/17/2012 1230

8260B VOC

Analysis Method:

8260B 5030B Analysis Batch:

500-147778

Instrument ID:

CMS19

Prep Method:

Prep Batch:

N/A

Lab File ID:

45519-05.D

Dilution:

1.0

Initial Weight/Volume: 5 mL

Analysis Date:

04/27/2012 0546

Final Weight/Volume: 5 mL

04/27/2012 0546

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0		0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0	•	0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0

Surrogate	%Rec	Qualifier	Acceptance Limits
4-Bromofluorobenzene (Surr)	90		75 - 120
Dibromofluoromethane	98		85 - 115
1,2-Dichloroethane-d4 (Surr)	95		70 - 120
Toluene-d8 (Surr)	100		85 - 120

Job Number: 500-45519-1

Client Sample ID:

JP-Tripblank-0412

Lab Sample ID:

500-45519-7TB

Water Client Matrix:

Date Sampled: 04/16/2012 1200

Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: 8260B Prep Method:

5030B

Analysis Batch: 500-147778

Instrument ID: Lab File ID:

CMS19

Dilution:

1.0

Prep Batch:

N/A

Initial Weight/Volume: 5 mL

45519-07.D

Analysis Date: Prep Date:

04/27/2012 0610 04/27/2012 0610 Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acetone	<5.0		1.9	5.0
Benzene	<1.0		0.12	1.0
Bromobenzene	<1.0		0.31	1.0
Bromochloromethane	<1.0		0.50	1.0
Bromodichloromethane	<1.0		0.23	1.0
Bromoform	<1.0		0.45	1.0
Bromomethane	<1.4		0.49	1.4
2-Butanone (MEK)	<5.0		1.0	5.0
n-Butylbenzene	<1.0		0.21	1.0
sec-Butylbenzene	<1.0		0.19	1.0
tert-Butylbenzene	<1.0		0.24	1.0
Carbon disulfide	<5.0		0.44	5.0
Carbon tetrachloride	<1.0		0.28	1.0
Chlorobenzene	<1.0		0.24	1.0
Dibromochloromethane	<1.0		0.25	1.0
Chloroethane	<1.4		0.33	1.4
Chloroform	<1.0		0.25	1.0
Chloromethane	<1.0		0.24	1.0
2-Chlorotoluene	<1.0		0.21	1.0
Vinyl acetate	<2.0		0.48	2.0
4-Chlorotoluene	<1.0		0.21	1.0
1,2-Dibromo-3-Chloropropane	<2.6		1.2	2.6
1,2-Dibromoethane	<1.0		0.45	1.0
Dibromomethane	<1.0		0.39	1.0
1.2-Dichlorobenzene	<1.0		0.21	1.0
1.3-Dichlorobenzene	<1.0		0.26	1.0
1,4-Dichlorobenzene	<1.0		0.24	1.0
Dichlorodifluoromethane	<1.0		0.26	1.0
1.1-Dichloroethane	<1.0		0.24	1.0
1,2-Dichloroethane	<1.0		0.28	1.0
1,1-Dichloroethene	<1.0		0.29	1.0
cis-1,2-Dichloroethene	<1.0		0.22	1.0
trans-1,2-Dichloroethene	<1.0		0.27	1.0
1,2-Dichloropropane	<1.0		0.36	1.0
1,3-Dichloropropane	<1.0		0.27	1.0
2,2-Dichloropropane	<1.0		0.31	1.0
1,1-Dichloropropene	<1.0		0.25	1.0
cis-1,3-Dichloropropene	<1.0		0.28	1.0
trans-1,3-Dichloropropene	<1.0		0.35	1.0
Ethylbenzene	<1.0		0.14	1.0
2-Hexanone	<5.0		0.56	5.0
Hexachlorobutadiene	<1.0		0.45	1.0
Isopropylbenzene	<1.0 VS		0.21	1.0
p-Isopropyltoluene	<1.0		0.24	1.0
Methylene Chloride	<3.0		0.63	3.0
4-Methyl-2-pentanone (MIBK)	<5.0		0.79	5.0

TestAmerica Chicago

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OS/39/2 05/08/2012

Job Number: 500-45519-1

Client Sample ID:

JP-Tripblank-0412

Lab Sample ID:

500-45519-7TB

Client Matrix:

Water

Date Sampled: 04/16/2012 1200

Date Received: 04/17/2012 1230

8260B VOC

Analysis Method: Prep Method:

8260B 5030B

Analysis Batch: 500-147778

Instrument ID: Lab File ID:

CMS19

Dilution:

1.0

Prep Batch:

N/A

45519-07.D

Analysis Date:

4-Bromofluorobenzene (Surr)

1,2-Dichloroethane-d4 (Surr)

Dibromofluoromethane

Toluene-d8 (Surr)

Initial Weight/Volume:

5 mL

Prep Date:

04/27/2012 0610 04/27/2012 0610 Final Weight/Volume: 5 mL

75 - 120

85 - 115

70 - 120

85 - 120

Analyte	Result (ug/L)	Qualifier	MDL	RL
Methyl tert-butyl ether	<1.0	44 COMMON COMPONICATION AND AND AND AND AND AND AND AND AND AN	0.28	1.0
Naphthalene	<1.0		0.24	1.0
N-Propylbenzene	<1.0		0.19	1.0
Styrene	<1.0		0.26	1.0
1,1,1,2-Tetrachloroethane	<1.0		0.31	1.0
1,1,2,2-Tetrachloroethane	<1.0		0.35	1.0
Tetrachloroethene	<1.0		0.22	1.0
Toluene	<1.0		0.15	1.0
1,2,3-Trichlorobenzene	<1.0		0.36	1.0
1,2,4-Trichlorobenzene	<1.0		0.22	1.0
1,1,1-Trichloroethane	<1.0		0.26	1.0
1,1,2-Trichloroethane	<1.0		0.30	1.0
Trichloroethene	<1.0		0.18	1.0
Trichlorofluoromethane	<1.0		0.22	1.0
1,2,3-Trichloropropane	<1.2		0.60	1.2
1,2,4-Trimethylbenzene	<1.0		0.22	1.0
1,3,5-Trimethylbenzene	<1.0		0.23	1.0
Vinyl chloride	<1.0		0.13	1.0
o-Xylene	<1.0		0.13	1.0
m&p-Xylene	<2.0		0.30	2.0
Xylenes, Total	<1.0		0.30	1.0
Surrogate	%Rec	Qualifier	Acceptance L	_imits

92

101

99

102

SDG ; Labor MET H	#: 27649B1 #: 500-45519-1 ratory: Test America, Inc. HOD: GC/MS Volatiles (E	- PA S	— :W 846 Meth	l nod 8260E	Level III		VORKSHEET		Date:/
attach	ned validation findings wo	rkshe	eets.						
	Validation	Area		<u> </u>			Comi	nents	
1.	Technical holding times			<u> </u>	Sampling date	es:	4/16/12		
II.	GC/MS Instrument performa	nce c	neck	<u> </u>	2/-0			· · · · · · · · · · · · · · · · · · ·	
111.	Initial calibration			<u> </u>	% pg =	<u> </u>	/15		
IV.	Continuing calibration/ICV			<u>SW</u>	CCV/10	V =	20		
V.	Blanks								
VI.	Surrogate spikes			A	dient				
VII.	Matrix spike/Matrix spike du	plicate	s	<u> </u>			· · · ·		
VIII.	Laboratory control samples			 _	LCS			<u>-</u>	
IX.	Regional Quality Assurance	and C	tuality Control	Ā					
X.	Internal standards			······					
XI.	Target compound identificat		ODs	N N					
XIII.	Compound quantitation/RL/I Tentatively identified compo			N N					
		unus (1103)		· · · · · · · · · · · · · · · · · · ·				
XIV.				N			·		
XV.	Overall assessment of data								
XVI.	Field duplicates			<u> </u>					
XVII.	Field blanks			ND	B= !	>			
Note: Validat	A = Acceptable N = Not provided/applicable SW = See worksheet ed Samples:		ND = No R = Rins FB = Fie		s detected	-) = Duplicate 'B = Trip blank 'EB = Equipment bla	ank	
1		11	MB 500	-14777	2 21			31	
2	JP-M11-GWMW802 JP-M11-GWMW805	11	10/15 300	·	21 22			31	
3	JP-M11-GWMW335	13			23			33	
4	JP-M11-GWMW336	14			24			34	
5	JP-Tripblank-0412	15			25			35	
6	e. Hipolatin of the	16			26			36	
<u> </u>			 					++	

1	JP-M11-GWMW802	11	MB 500-147718	21	31
2	JP-M11-GWMW805	12		22	32
3	JP-M11-GWMW335	13		23	33
4	JP-M11-GWMW336	14		24	34
5	JP-Tripblank-0412	15	:	25	35
6		16		26	36
7		17		27	37
8		18		28	38
9		19		29	39
10		20		30	40

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. lodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	РРРР.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	ବରବର.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	ТТТ.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	ບບບບ.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	vvvv.

1DC#: 2764 9.B.1

VALIDATION FINDINGS WORKSHEET Continuing Calibration

Page: 1 of 1 Reviewer:_ 2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Y N N/A

Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ? Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

Standard ID Compound (Limit: 20.0%) Finding RRF Associated Samples P Sch	Qualifications	5M3 A	,														
Finding %D Compound (Limit: <20.0%)	Associated Samples	<u>γη</u>	ما														
	Finding RRF (Limit: ≥0.05)																
	Finding %D (Limit: <20.0%)	702								-							
Standard ID	Compound	//															
	Standard ID	6140561	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	,													
# Date 1/20/12	 	/oc/1															

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 16, 2012

LDC Report Date: May 24, 2012

Matrix: Water

Parameters: Semivolatiles

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45519-1

Sample Identification

JP-M11-GWMW802

JP-M11-GWMW805

JP-M11-GWMW335

JP-M11-GWMW336

Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs) with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
5/1/12	N-Nitrosodimethylamine 3&4-Methylphenol Dibenzofuran Di-n-butylphthalate Benzo(k)fluoranthene	33.0 19.0 17.0 17.0 22.0	JP-M11-GWMW802 JP-M11-GWMW805 JP-M11-GWMW335 MB 500-146890	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	А
4/25/12	Benzoic acid 2,4-Dinitrophenol	55.0 19.0	JP-M11-GWMW336	J (all detects) J (all detects)	А

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
5/4/12	N-Nitrosodimethylamine Benzoic acid 2,4-Dinitrophenol 4-Nitrophenol	41.8 44.4 32.5 25.6	JP-M11-GWMW336	J (all detects) UJ (all non-detects)	А

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
5/1/12	2-Methylnaphthalene Dibenzofuran Di-n-butylphthalate	20.3 21.3 20.5	JP-M11-GWMW802 JP-M11-GWMW805 JP-M11-GWMW335 MB 500-146890	J (all detects) UJ (all non-detects)	А
4/25/12	Benzoic acid	125.4	JP-M11-GWMW336	J (all detects) UJ (all non-detects)	Α

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were not within QC limits. Since there were no associated samples, no data were qualified.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and RLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

Data flags are summarized at the end of this report if data has been qualified.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW Semivolatiles - Data Qualification Summary - SDG 500-45519-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45519-1	JP-M11-GWMW802 JP-M11-GWMW805 JP-M11-GWMW335	N-Nitrosodimethylamine 3&4-Methylphenol Dibenzofuran Di-n-butylphthalate Benzo(k)fluoranthene	J (all detects) J (all detects) J (all detects) J (all detects) J (all detects)	А	Initial calibration (%RSD)
500-45519-1	JP-M11-GWMW336	Benzoic acid 2,4-Dinitrophenol	J (all detects)	A	Initial calibration (%RSD)
500-45519-1	JP-M11-GWMW336	N-Nitrosodimethylamine Benzoic acid 2,4-Dinitrophenol 4-Nitrophenol	J (all detects) UJ (all non-detects)	А	Continuing calibration (%D)
500-45519-1	JP-M11-GWMW802 JP-M11-GWMW805 JP-M11-GWMW335	2-Methylnaphthalene Dibenzofuran Di-n-butylphthalate	J (all detects) UJ (all non-detects)	А	Continuing calibration (ICV %D)
500-45519-1	JP-M11-GWMW336	Benzoic acid	J (all detects) UJ (all non-detects)	А	Continuing calibration (ICV %D)

JOAAP-GW

Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

JOAAP-GW

Semivolatiles - Field Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW802

Lab Sample ID:

500-45519-2

Client Matrix:

Water

04/19/2012 0759

Date Sampled: 04/16/2012 1140

Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C Prep Method:

3510C

Analysis Batch: 500-148426

Instrument ID:

CMS12

Dilution:

1.0

Prep Batch:

500-146890

Lab File ID:

45519-2.D

Analysis Date: Prep Date:

05/02/2012 2342

Initial Weight/Volume: 1070 mL Final Weight/Volume:

1.0 mL

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL	
Acenaphthene	<0.93		0.34	0.93	
N-Nitrosodimethylamine	<9.3		1.3	9.3	
Acenaphthylene	<0.93		0.30	0.93	
Anthracene	<0.93		0.30	0.93	
Benzidine	<37		19	37	
Benzoic acid	<19		4.3	19	
Benzo[a]anthracene	<0.19		0.041	0.19	
Benzo[b]fluoranthene	<0.19		0.054	0.19	
Benzo[k]fluoranthene	<0.23		0.069	0.23	
Benzo[g,h,i]perylene	<0.93		0.39	0.93	
Benzo[a]pyrene	<0.19		0.052	0.19	
Benzyl alcohol	<19		2.9	19	
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9	
Bis(2-chloroethyl)ether	<1.9		0.33	1.9	
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9	
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3	
4-Bromophenyl phenyl ether	<4.7		0.85	4.7	
Butyl benzyl phthalate	<1.9		0.25	1.9	
Carbazole	<4.7		0.93	4.7	
4-Chloroaniline	<9.3		2.0	9.3	
4-Chloro-3-methylphenol	<9.3		2.1	9.3	
2-Chloronaphthaiene	<1.9		0.32	1.9	
2-Chlorophenol	<4.7		0.75	4.7	
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7	
Chrysene	<0.47		0.13	0.47	
Dibenz(a,h)anthracene	<0.28		0.060	0.28	
Dibenzofuran	<1.9 US		0.33	1.9	
Di-n-butyl phthalate	<4.7 V S		0.75	4.7	
1,2-Dichlorobenzene	<1.9		0.27	1.9	
1,3-Dichlorobenzene	<1.9		0.23	1.9	
1,4-Dichlorobenzene	<1.9		0.25	1.9	
3,3'-Dichlorobenzidine	<4.7		0.88	4.7	
2,4-Dichlorophenol	<9.3		2.1	9.3	
Diethyl phthalate	<1.9		0.41	1.9	
2,4-Dimethylphenol	<9.3		3.1	9.3	
Dimethyl phthalate	<1.9		0.36	1.9	
4,6-Dinitro-2-methylphenol	<19		4.6	19	
2,4-Dinitrophenol	<19		6.9	19	
2,4-Dinitrotoluene	<1.3		0.28	1.3	
2,6-Dinitrotoluene	<0.47		0.11	0.47	
Di-n-octyl phthalate	<9.3		2.3	9.3	
Fluoranthene	<0.93		0.30	0.93	
Fluorene	<0.93		0.36	0.93	
1,2-Diphenylhydrazine	<4.7		0.65	4.7	
Hexachlorobenzene	<0.47		0.13	0.47	
Hexachlorobutadiene	<4.7		1.0	4.7	

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05/08/2012

Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW802

Lab Sample ID:

500-45519-2

05/02/2012 2342

04/19/2012 0759

Client Matrix:

Water

Date Sampled: 04/16/2012 1140

Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C Prep Method:

Analysis Date:

Prep Date:

Dilution:

1,2,4-Trichlorobenzene

2,4,5-Trichlorophenol

2,4,6-Trichlorophenol

3510C

1.0

Analysis Batch: 500-148426 Prep Batch:

500-146890

Instrument ID: Lab File ID:

CMS12

Initial Weight/Volume: 1070 mL

45519-2.D

1.9

9.3

4.7

Final Weight/Volume: Injection Volume:

0.28

2.1

1.0

1.0 mL 1 uL

				5.
Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	o.47 کک		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9 .
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	< 0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	25	· AND COME A COMMUNICATION OF THE PARTY OF T	20 - 110
Phenoi-d5	17		10 - 115
Nitrobenzene-d5	46		40 - 110
2-Fluorobiphenyl	49	X	50 - 110
2,4,6-Tribromophenol	56		40 - 125
Terphenyl-d14	72		50 - 135

<1.9

<9.3

<4.7

Client: Toltest Inc. Job Number: 500-45519-1

Client Sample ID: JP-M11-GWMW805

 Lab Sample ID:
 500-45519-3
 Date Sampled: 04/16/2012 1235

 Client Matrix:
 Water
 Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C Analysis Batch: 500-148426 Instrument ID: CMS12
Prep Method: 3510C Prep Batch: 500-146890 Lab File ID: 45519-3.D
Dilution: 1.0 Initial Weight/Volume: 1070 mL

Analysis Date: 05/03/2012 0004 Final Weight/Volume: 1.0 mL

Prep Date: 04/19/2012 0759 Injection Volume: 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
	<1.9		0.33	1.9
Bis(2-chloroethyl)ether	<1.9		0.28	1.9
2,2'-oxybis[1-chloropropane]			2.3	9.3
Bis(2-ethylhexyl) phthalate	<9.3		0.85	4.7
4-Bromophenyl phenyl ether	<4.7		0.85	1.9
Butyl benzyl phthalate	<1.9			
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9 5		0.33	1.9
Di-n-butyl phthalate	<4.7 VS		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
·	<9.3		2.3	9.3
Di-n-octyl phthalate	<0.93		0.30	0.93
Fluoranthene	<0.93		0.36	0.93
Fluorene	<4.7		0.65	4.7
1,2-Diphenylhydrazine			0.03	0.47
Hexachlorobenzene	<0.47		1.0	4.7
Hexachlorobutadiene	<4.7		1.0	7.1

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Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW805

Lab Sample ID:

500-45519-3

Client Matrix:

Water

Date Sampled: 04/16/2012 1235

Date Received: 04/17/2012 1230

Analysis Method: 8270C Prep Method:

3510C

Analysis Batch: 500-148426

Instrument ID:

CMS12

Dilution:

1.0

Prep Batch:

500-146890 Lab File ID:

45519-3.D

Analysis Date:

Initial Weight/Volume: Final Weight/Volume:

1070 mL 1.0 mL

Prep Date:

Phenol-d5

2-Fluorophenol

Nitrobenzene-d5

2-Fluorobiphenyl

Terphenyl-d14

2.4,6-Tribromophenol

05/03/2012 0004 04/19/2012 0759

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 US		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7
Surrogate	%Rec	Qualifier	Accepta	ance Limits

25

17

48

52

58

75

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20 - 110

10 - 115

40 - 110

50 - 110

40 - 125

50 - 135

Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW335

Lab Sample ID:

500-45519-4

Client Matrix:

Water

Date Sampled: 04/16/2012 1325 Date Received: 04/17/2012 1230

8270C SVOC

Result (ug/L)

Analysis Method: 8270C

3510C

Analysis Batch: 500-148426 Prep Batch:

Instrument ID: Lab File ID:

Qualifier

CMS12

Prep Method: Dilution:

1.0

500-146890

Initial Weight/Volume:

45519-4.D 1070 mL

RL

Analysis Date:

Analyte

05/03/2012 0027

Final Weight/Volume: Injection Volume:

MDL

1.0 mL 1 uL

Prep Date:	04/19/20

_		_			_		-		
0	4	1	9	12	o,	12	0	75	9

Analyte	rvesuit (ug/L)	Quamer	IVIDE	1 \
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19		4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chioro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthaiene	<1.9		0.32	1.9
2-Chiorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	< 0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9 V		0.33	1.9
Di-n-butyl phthalate	<4.7 VS		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7
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05/08/2012

Date Sampled: 04/16/2012 1325

Job Number: 500-45519-1 Client: Toltest Inc.

JP-M11-GWMW335 Client Sample ID:

500-45519-4 Lab Sample ID:

Date Received: 04/17/2012 1230 Client Matrix: Water

8270C SVOC

CMS12 Analysis Batch: 500-148426 Instrument ID: Analysis Method: 8270C 45519-4.D Prep Batch: 500-146890 Lab File ID: Prep Method: 3510C Initial Weight/Volume: 1070 mL

1.0 Dilution: Final Weight/Volume:

1.0 mL Analysis Date: 05/03/2012 0027 Injection Volume: 1 uL Prep Date: 04/19/2012 0759

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47 5		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7
Surrogate	%Rec	Qualifier	Accepta	ance Limits
2-Fluorophenol	26		20 - 110)
Phenoi-d5	19		10 - 115	5
Nitrobenzene-d5	53		40 - 110	
2-Fluorobiphenyl	54		50 - 110)

Surrogate	%Rec	Qualifier Ac	ceptance Limits
2-Fluorophenol	26	20	- 110
Phenoi-d5	19	10	- 115
Nitrobenzene-d5	53	40	- 110
2-Fluorobiphenyl	54	50	- 110
2,4,6-Tribromophenol	70	40	- 125
Terphenyl-d14	73	50	- 135

Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW336

Lab Sample ID:

500-45519-5

Client Matrix:

Water

Date Sampled: 04/16/2012 1410

Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C Prep Method:

3510C

Analysis Batch: Prep Batch:

500-148703

Instrument ID: Lab File ID:

CMS21 45519-5.D

Dilution:

1.0

500-146890

Initial Weight/Volume: Final Weight/Volume:

1070 mL 1.0 mL

Analysis Date: Prep Date:

05/04/2012 1812 04/19/2012 0759

Injection Volume:

1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Acenaphthene	<0.93		0.34	0.93
N-Nitrosodimethylamine	<9.3 UT		1.3	9.3
Acenaphthylene	<0.93		0.30	0.93
Anthracene	<0.93		0.30	0.93
Benzidine	<37		19	37
Benzoic acid	<19 US	٨	4.3	19
Benzo[a]anthracene	<0.19		0.041	0.19
Benzo[b]fluoranthene	<0.19		0.054	0.19
Benzo[k]fluoranthene	<0.23		0.069	0.23
Benzo[g,h,i]perylene	<0.93		0.39	0.93
Benzo[a]pyrene	<0.19		0.052	0.19
Benzyl alcohol	<19		2.9	19
Bis(2-chloroethoxy)methane	<1.9		0.28	1.9
Bis(2-chloroethyl)ether	<1.9		0.33	1.9
2,2'-oxybis[1-chloropropane]	<1.9		0.28	1.9
Bis(2-ethylhexyl) phthalate	<9.3		2.3	9.3
4-Bromophenyl phenyl ether	<4.7		0.85	4.7
Butyl benzyl phthalate	<1.9		0.25	1.9
Carbazole	<4.7		0.93	4.7
4-Chloroaniline	<9.3		2.0	9.3
4-Chloro-3-methylphenol	<9.3		2.1	9.3
2-Chloronaphthalene	<1.9		0.32	1.9
2-Chlorophenol	<4.7		0.75	4.7
4-Chlorophenyl phenyl ether	<4.7		0.76	4.7
Chrysene	<0.47		0.13	0.47
Dibenz(a,h)anthracene	<0.28		0.060	0.28
Dibenzofuran	<1.9		0.33	1.9
Di-n-butyl phthalate	<4.7		0.75	4.7
1,2-Dichlorobenzene	<1.9		0.27	1.9
1,3-Dichlorobenzene	<1.9		0.23	1.9
1,4-Dichlorobenzene	<1.9		0.25	1.9
3,3'-Dichlorobenzidine	<4.7		0.88	4.7
2,4-Dichlorophenol	<9.3		2.1	9.3
Diethyl phthalate	<1.9		0.41	1.9
2,4-Dimethylphenol	<9.3		3.1	9.3
Dimethyl phthalate	<1.9		0.36	1.9
4,6-Dinitro-2-methylphenol	<19		4.6	19
2,4-Dinitrophenol	<19 U S		6.9	19
2,4-Dinitrotoluene	<1.3		0.28	1.3
2,6-Dinitrotoluene	<0.47		0.11	0.47
Di-n-octyl phthalate	<9.3		2.3	9.3
Fluoranthene	<0.93		0.30	0.93
Fluorene	<0.93		0.36	0.93
1,2-Diphenylhydrazine	<4.7		0.65	4.7
Hexachlorobenzene	<0.47		0.13	0.47
Hexachlorobutadiene	<4.7		1.0	4.7
1 ISAGONIOI ODULAGISTIC	-7.1			•••

TestAmerica Chicago

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4.7 CS/24/12 05/08/2012

Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW336

Lab Sample ID:

500-45519-5

Client Matrix:

Water

Date Sampled: 04/16/2012 1410

Date Received: 04/17/2012 1230

8270C SVOC

Analysis Method: 8270C Prep Method:

3510C

Analysis Batch: Prep Batch:

500-148703

Instrument ID: Lab File ID:

CMS21 45519-5.D

Dilution:

1.0

500-146890

Initial Weight/Volume: Final Weight/Volume:

1070 mL

Analysis Date: Prep Date:

05/04/2012 1812 04/19/2012 0759

Injection Volume:

1.0 mL 1 uL

Analyte	Result (ug/L)	Qualifier	MDL	RL
Hexachloroethane	<4.7		0.91	4.7
Indeno[1,2,3-cd]pyrene	<0.23		0.079	0.23
Isophorone	<1.9		0.27	1.9
2-Methylnaphthalene	<0.47		0.12	0.47
2-Methylphenol	<1.9		0.29	1.9
3 & 4 Methylphenol	<1.9		0.41	1.9
Naphthalene	<0.93		0.28	0.93
2-Nitroaniline	<4.7		1.0	4.7
3-Nitroaniline	<9.3		2.1	9.3
4-Nitroaniline	<9.3		3.7	9.3
Nitrobenzene	<0.93		0.42	0.93
2-Nitrophenol	<9.3		2.0	9.3
4-Nitrophenol	<19 UT		2.2	19
N-Nitrosodiphenylamine	<0.93		0.32	0.93
N-Nitrosodi-n-propylamine	<0.47		0.13	0.47
Pentachlorophenol	<9.3		5.2	9.3
Phenanthrene	<0.93		0.33	0.93
Phenol	<4.7		0.34	4.7
Pyrene	<0.93		0.45	0.93
1,2,4-Trichlorobenzene	<1.9		0.28	1.9
2,4,5-Trichlorophenol	<9.3		2.1	9.3
2,4,6-Trichlorophenol	<4.7		1.0	4.7

Surrogate	%Rec	Qualifier	Acceptance Limits
2-Fluorophenol	27	**************************************	20 - 110
Phenol-d5	17		10 - 115
Nitrobenzene-d5	52		40 - 110
2-Fluorobiphenyl	47	Χ	50 - 110
2,4,6-Tribromophenol	58		40 - 125
Terphenyl-d14	71		50 - 135

SDG # ₋abora	atory: Test America, Inc.	- 	į	_evel III	SS WOR	KSHEET		Date: \(\sqrt{\sq}}}}}}}}}}}}} \end{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}}}} \end{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}}}}}} \end{\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}}} \end{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sq}
	OD: GC/MS Semivolatile	•		·				
The sa attache	amples listed below were ed validation findings wo	reviewed for ear rksheets.	ch of the f	ollowing vali	dation area	s. Validatio	n findings are	noted in
	Validation /	Area				Comm	ents	
l.	Technical holding times		À	Sampling date	es:	16/12		
II.	GC/MS Instrument performa	nce check	À	·		,		
III.	Initial calibration		SW	%RSD =	30/15,1	-2		
IV.	Continuing calibration/ICV		SW	COVAC	v ≤ 20			
V.	Blanks		<u> </u>	,				
VI.	Surrogate spikes		SW					
VII.	Matrix spike/Matrix spike dup	licates	SW	JP-M13	-GWMW/	36R -	no used	I no qual
VIII.	Laboratory control samples		A	405				<u> </u>
IX.	Regional Quality Assurance	and Quality Control	N					
X.	Internal standards		4					
XI.	Target compound identificati	on	N					
XII.	Compound quantitation/RL/L	OQ/LODs	N					
XIII.	Tentatively identified compou	unds (TICs)	N					
XIV.	System performance	···	N					
XV.	Overall assessment of data		A	1				
XVI.	Field duplicates		N					
XVII.	•		N					
Note:	Field blanks A = Acceptable N = Not provided/applicable SW = See worksheet d Samples:	R = Rin	o compound	s detected	D = Dup TB = Tri EB = Eq		k	
1 ,	JP-M11-GWMW802	11 MB 50	0-141-0	D 21			31	
	JP-M11-GWMW805	12	- 1165	22			32	
	JP-M11-GWMW335	13		23			33	
							34	
4 .	JP-M11-GWMW336	14		24			35	

1	JP-M11-GWMW802	11	MB 500-146890	21	31	
2	JP-M11-GWMW805	12	,	22	32	
3	JP-M11-GWMW335	13		23	33	
4	JP-M11-GWMW336	14		24	34	
5		15		25	35	
6		16		26	36	
7		17		27	37	
8		18		28	 38	
9		19		29	39	
10		20		30	40	
				<u> </u>		

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA

A. Phenol	S. Naphthalene	KK. 2,4-Dinitrotoluene	CCC. Benzo(a)anthracene	UUU. Benzo(b)thiophene
B. Bis (2-chloroethyl) ether	T. 4-Chloroaniline	LL. Diethylphthalate	DDD. Chrysene	VVV.Naphthobenzothiophene
C. 2-Chlorophenol	U. Hexachlorobutadiene	MM. 4-Chlorophenyl-phenyl ether	EEE. Bis(2-ethylhexyl)phthalate	WWW.Benzo(e)pyrene
D. 1,3-Dichlorobenzene	V. 4-Chloro-3-methylphenol	NN. Fluorene	FFF. Di-n-octylphthalate	XXX. 2,6-Dimethylnaphthalene
E. 1,4-Dichlorobenzene	W. 2-Methylnaphthalene	OO. 4-Nitroaniline	GGG. Benzo(b)fluoranthene	YYY. 2,3,5-Trimethylnaphthalene
F. 1,2-Dichlorobenzene	X. Hexachlorocyclopentadiene	PP. 4,6-Dinitro-2-methylphenol	HHH. Benzo(k)fluoranthene	ZZZ. Perylene
G. 2-Methylphenol	Y. 2,4,6-Trichlorophenol	QQ. N-Nitrosodiphenylamine (1)	III. Benzo(a)pyrene	AAAA. Dibenzothiophene
H. 2,2'-Oxybis(1-chloropropane)	Z. 2,4,5-Trichlorophenol	RR. 4-Bromophenyl-phenylether	JJJ. Indeno(1,2,3-cd)pyrene	BBBB. Benzo(a)fluoranthene
I. 4-Methylphenol	AA. 2-Chloronaphthalene	SS. Hexachlorobenzene	KKK. Dibenz(a,h)anthracene	CCCC. Benzo(b)fluorene
J. N-Nitroso-di-n-propylamine	BB. 2-Nitroaniline	TT. Pentachlorophenol	LLL. Benzo(g,h,i)perylene	DDDD. cis/frans-Decalin
K. Hexachloroethane	CC. Dimethylphthalate	UU. Phenanthrene	MMM. Bis(2-Chloroisopropyl)ether	EEEE. Biphenyl
L. Nitrobenzene	DD. Acenaphthylene	VV. Anthracene	NNN. Aniline	FFFF. Retene
M. Isophorone	EE. 2,6-Dinitrotoluene	WW. Carbazole	OOO. N-Nitrosodimethylamine	GGGG. C30-Hopane
N. 2-Nitrophenol	FF. 3-Nitroaniline	XX. Di-n-buty/phthalate	PPP. Benzoic Acid	HHHH. 1-Methylphenanthrene
O. 2,4-Dimethylphenol	GG. Acenaphthene	YY. Fluoranthene	QQQ. Benzyl alcohol	IIII. 2-Naphthylamine
P. Bis(2-chloroethoxy)methane	HH. 2,4-Dinitrophenol	ZZ. Pyrene	RRR. Pyridine	JJJJ. 1,4-Dioxane
Q. 2,4-Dichlorophenol	II. 4-Nitrophenol	AAA. Butyibenzylphthalate	SSS. Benzidine	ккк.
R. 1,2,4-Trichlorobenzene	JJ. Dibenzofuran	BBB. 3,3'-Dichlorobenzidine	TTT. 1-Methylnaphthalene	ULL.

LDC # 27649 B2

VALIDATION FINDINGS WORKSHEET Initial Calibration

lof |

Page: Reviewer:_

2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Did the laboratory conduct an acceptable 5 point calibration prior to sample analysis?

Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?

Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation? Did the initial calibration meet the acceptance criteria? Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF? X N N/A N/N/N

Qualifications	JAM /4				→	Joseph /A	,										
Associated Samples	2-1	0689/11-005 3/N				7											
Finding RRF (Limit: <u>></u> 0.05)																	
Finding %RSD (Limit: <30.0%)	l	19.0			22.0	65.0	19.0										
Compound	9	32 4-Netholomas	1.0 5	XX	H#H	dad	主										
Standard ID	197					104											
# Date	121/15					72/72/1	\										

LDC# >7649 B>

VALIDATION FINDINGS WORKSHEET

Reviewer: Page:

2nd Reviewer:_

Continuing Calibration

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". METHOD: GC/MS BNA (EPA SW 846 Method 8270C) Y N N/A

Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument? Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's? Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF?

Qualifications	7/17/4			-		3/47/4						>						
Associated Samples	1-2	N.B. 5300-1-6890											And the second s					
Finding RRF (Limit: <u>></u> 0.05)																		
Finding %D (Limit: <20.0%)	4.8	21.3	25.0			1.25		2.14	ተነ ተ	-335	3.55	25.6						
Compound	M	17	Ž			ddd		8	ddd	*	##							
Standard ID	ICVI					ICVMIXI		210504B										
# Date	21/12					<1/22/h	`	2/1/12										

LDC#2764982

VALIDATION FINDINGS WORKSHEET Surrogate Recovery

Page: lof 1

2nd Reviewer: _ 😝 Reviewer:___

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)
Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A
Were percent recoveries (%R) for surrogates within QC limits?

If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R? If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

Qualifications	to the		No qual				1.7																		OC Limits (Water)
mits)	(20-10)	(,)	(50-110)	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	()	(OC Limits (Soil)
%R (Limits)	47	-	<u>را</u> ﴿																						
Surrogate	7.50		FBP																						ater)
Sample ID	7																								OC Limits (Soil) OC Limits (Water)
# Date																									* OC limite are advicory

QC Limits (Water)	Z1-100	10-123	33-110*	16-110*
QC Limits (Soil)	25-121	19-122	20-130*	20-130*
i	S5 (2FP)= 2-Fluorophenol	S6 (TBP) = 2,4,6-Tribromophenol	S7 (2CP) = 2-Chlorophenol-d4	S8 (DCB) = 1,2-Dichlorobenzene-d4
QC Limits (Water)	35-114	43-116	33-141	10-94
* QC limits are advisory QC Limits (Soil)	S1 (NBZ) = Nitrobenzene-d5 23-120	S2 (FBP) = 2-Fluorobiphenyl 30-115	S3 (TPH) = Terphenyl-d14 18-137	S4 (PHL) = Phenol-d5 24-113

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

JOAAP-GW

Collection Date:

April 16, 2012

LDC Report Date:

May 18, 2012

Matrix:

Water

Parameters:

Dissolved Metals

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45519-1

Sample Identification

JP-M11-GWMW802

JP-M11-GWMW805

JP-M11-GWMW335

JP-M11-GWMW336

Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B and 7470A for Dissolved Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. ICPMS Tune

ICP-MS was not utilized in this SDG.

III. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No dissolved metal contaminants were found in the initial, continuing and preparation blanks.

No field blanks were identified in this SDG.

V. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

VI. Matrix Spike/(Matrix Spike) Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

X. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

XI. ICP Serial Dilution

ICP serial dilution analysis was not performed by the laboratory.

XII. Sample Result Verification

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW

Dissolved Metals - Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

JOAAP-GW

Dissolved Metals - Laboratory Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

JOAAP-GW

Dissolved Metals - Field Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

ICP5

Client: Toltest Inc. Job Number: 500-45519-1

Client Sample ID: JP-M11-GWMW802

 Lab Sample ID:
 500-45519-2
 Date Sampled:
 04/16/2012 1140

 Client Matrix:
 Water
 Date Received:
 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method: 6010B Analysis Batch: 500-148076 Instrument ID:

Prep Method: 3010A Prep Batch: 500-147889 Lab File ID: P50428B Dilution: 1.0 Initial Weight/Volume: 50 mL

Dilution: 1.0 Initial Weight/Volume: 50 mL Analysis Date: 04/28/2012 2307 Final Weight/Volume: 50 mL

Prep Date: 04/27/2012 0930

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.026		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	75		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0012	J	0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	34		0.024	0.10
Manganese	0.75		0.0011	0.010
Nickel	0.0023	J	0.0019	0.010
Potassium	2.0		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	19		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0025	J	0.00062	0.0050
Zinc	0.0078	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: 7470A Analysis Batch: 500-147745 Instrument ID: HG6

Prep Method: 7470A Prep Batch: 500-147564 Lab File ID: 042612R.CSV

Dilution: 1.0 Initial Weight/Volume: 25 mL

Analysis Date: 04/26/2012 1121 Final Weight/Volume: 25 mL

 Analyte
 Result (ug/L)
 Qualifier
 MDL
 RL

 Mercury
 <0.20</td>
 0.070
 0.20

Ospala

Prep Date:

04/25/2012 1000

Job Number: 500-45519-1 Client: Toltest Inc.

Client Sample ID:

JP-M11-GWMW805

Lab Sample ID: Client Matrix:

500-45519-3

Water

Date Sampled: 04/16/2012 1235

Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method: 6010B Prep Method:

3010A

Analysis Date: Prep Date:

Dilution:

1.0

04/28/2012 2320 04/27/2012 0930 Analysis Batch: Prep Batch:

500-148076 500-147889

Instrument ID: Lab File ID:

ICP5 P50428B

Initial Weight/Volume: 50 mL

Final Weight/Volume: 50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20		0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.028		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	110		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0016	J	0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	75		0.024	0.10
Manganese	<0.010		0.0011	0.010
Nickel	0.0059	J	0.0019	0.010
Potassium	9.5		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Thallium	<0.010		0.0013	0.010
Vanadium	0.0037	J	0.00062	0.0050
Zinc	0.0078	J	0.0047	0.020

Analysis Method:

6010B 3010A

Prep Method: Dilution:

10

Analysis Date: Prep Date:

04/28/2012 2327

04/27/2012 0930

500-148076 Analysis Batch: Prep Batch:

500-147889

Instrument ID: Lab File ID:

ICP5 P50428B

Initial Weight/Volume: 50 mL

Final Weight/Volume: 50 mL

RL Qualifier MDL Result (mg/L) Analyte 1.2 10 97 Sodium

7470A Mercury (CVAA)-Dissolved

Analysis Method: Prep Method:

7470A 7470A

Dilution: Analysis Date:

1.0 04/26/2012 1217

Prep Date: 04/25/2012 1000 Analysis Batch: Prep Batch:

500-147745 500-147564

Lab File ID:

Instrument ID:

HG6

042612R.CSV

Initial Weight/Volume: 25 mL Final Weight/Volume: 25 mL

Result (ug/L) Qualifier MDL Analyte <0.20 0.070 0.20 Mercury

025/22/12 05/08/2012

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Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW335

Lab Sample ID:

500-45519-4

Client Matrix:

Water

Date Sampled: 04/16/2012 1325

Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method: Prep Method:

6010B 3010A Analysis Batch: Prep Batch:

500-148076 500-147889

Instrument ID: Lab File ID:

ICP5 P50428B

Dilution: Analysis Date:

Prep Date:

1.0

04/28/2012 2333 04/27/2012 0930 Initial Weight/Volume:

50 mL

Final Weight/Volume:

50 mL

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20	CA. 2000-100-100-100-100-100-100-100-100-100	0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.021		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	210		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0051	J	0.0011	0.010
Iron	<0.20		0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	140		0.024	0.10
Manganese	<0.010		0.0011	0.010
Nickel	0.0024	J	0.0019	0.010
Potassium	6.4		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Sodium	48		0.12	1.0
Thallium	<0.010		0.0013	0.010
Vanadium	0.0047	J	0.00062	0.0050
Zinc	0.0047	J	0.0047	0.020

7470A Mercury (CVAA)-Dissolved

Analysis Method: Prep Method:

Analysis Date:

7470A 7470A

1.0

04/26/2012 1219

Analysis Batch: 500-147745 500-147564 Prep Batch:

Instrument ID: Lab File ID:

HG6

042612R.CSV

Initial Weight/Volume: Final Weight/Volume:

25 mL 25 mL

Analyte Mercury

Prep Date:

Dilution:

04/25/2012 1000

Result (ug/L) <0.20

Qualifier

MDL 0.070 RL 0.20

Job Number: 500-45519-1 Client: Toltest Inc.

Client Sample ID:

JP-M11-GWMW336

Lab Sample ID:

500-45519-5

Client Matrix:

Water

Date Sampled: 04/16/2012 1410

Date Received: 04/17/2012 1230

6010B Metals (ICP)-Dissolved

Analysis Method: Prep Method:

6010B 3010A

Dilution: Analysis Date: Prep Date:

1.0

04/28/2012 2346 04/27/2012 0930 Analysis Batch: Prep Batch:

500-148076 500-147889

Instrument ID: Lab File ID:

ICP5 P50428B

Initial Weight/Volume: 50 mL

50 mL

Final Weight/Volume:

Analyte	Result (mg/L)	Qualifier	MDL	RL
Aluminum	<0.20	EN (COURT A DE SOURCE CONTRACTOR A DE SOURCE A DE SOURCE A DE SOURCE A DE SOURCE A DE SOURCE A DE SOURCE A DE S	0.025	0.20
Antimony	<0.020		0.0026	0.020
Arsenic	<0.010		0.0024	0.010
Barium	0.020		0.00044	0.010
Beryllium	<0.0040		0.00044	0.0040
Cadmium	<0.0020		0.00054	0.0020
Calcium	120		0.087	0.20
Chromium	<0.010		0.00096	0.010
Cobalt	<0.0050		0.0010	0.0050
Copper	0.0011	J	0.0011	0.010
Iron	0.15	j	0.070	0.20
Lead	<0.0050		0.0016	0.0050
Magnesium	80		0.024	0.10
Manganese	0.033		0.0011	0.010
Nickel	<0.010		0.0019	0.010
Potassium	4.1		0.070	0.50
Selenium	<0.010		0.0027	0.010
Silver	<0.0050		0.0011	0.0050
Thallium	<0.010		0.0013	0.010
Vanadium	0.0040	j	0.00062	0.0050
Zinc	0.0069	J	0.0047	0.020

Analysis Method: Prep Method:

6010B 3010A

Dilution:

10

Analysis Date: Prep Date:

04/28/2012 2352 04/27/2012 0930 Analysis Batch: Prep Batch:

500-148076 500-147889

Instrument ID: Lab File ID:

ICP5 P50428B

Initial Weight/Volume: 50 mL

Final Weight/Volume: 50 mL

Qualifier MDL RL Result (mg/L) Analyte 1.2 10 56 Sodium

7470A Mercury (CVAA)-Dissolved

Analysis Method: Prep Method:

7470A 7470A 1.0

Dilution: Analysis Date: Prep Date:

04/26/2012 1221

04/25/2012 1000

Analysis Batch: 500-147745 Prep Batch:

500-147564

Instrument ID:

HG6

042612R.CSV Lab File ID: Initial Weight/Volume: 25 mL

Final Weight/Volume: 25 mL

Qualifier MDL Analyte Result (ug/L) 0.20 0.070 <0.20 Mercury

05/08/2012

SDG#	: <u>27649B4</u> : <u>500-45519-1</u>		LIDATIO		PLETE Level		ESS WORKSHEET	Γ	Date: <u>5-17-</u> 1; Page: <u>1</u> of <u>1</u>
Labora	atory: <u>Test America, Inc</u>				9ma	<u>4</u> .			Reviewer: MG 2nd Reviewer:
METH	OD: Dissolved Metals (EPA S	SW 846 Met	hod 6010	•				Zild Neviewer
	amples listed below wer ion findings worksheets		ewed for ead	ch of the	following	g va	alidation areas. Validat	ion fine	dings are noted in attached
	Validation	Area					Com	nents	
1.	Technical holding times			Α	Samplir	ng d	ates: 4-16-1	2	
II.	ICP/MS Tune			2			utilized		
III.	Calibration			Α					
IV.	Blanks			Α					
V.	ICP Interference Check Sa	mple (I	CS) Analysis	Α					
VI.	Matrix Spike Analysis			7	cl	ie	nt specified		
VII.	Duplicate Sample Analysis			2					
VIII.	Laboratory Control Sample			Α	LC	s			
IX.	Internal Standard (ICP-MS)			2	not		otilized		
X.	Furnace Atomic Absorption			7	10		ι(
XI.	ICP Serial Dilution			7	NO	t	performed		
XII.	Sample Result Verification	·		N					
XIII.	Overall Assessment of Dat	а		Α					
XIV.	Field Duplicates			N					
XV	Field Blanks			7					
Note:	A = Acceptable N = Not provided/applicabl SW = See worksheet	e	R = Rins	o compound sate eld blank	ds detecte	ed	D = Duplicate TB = Trip blank EB = Equipment bla	ınk	
	all water		<u></u>					<u> </u>	
1	JP-M11-GWMW802	11			2	1		31	
2	JP-M11-GWMW805	12		, , , , , , , , , , , , , , , , , , , 	2	2		32	
3	JP-M11-GWMW335	13			2	3		33	
4	JP-M11-GWMW336	14			2	4		34	
5		15			2	:5		35	
6		16			2	:6		36	
7		17			2	7		37	
8		18			2	:8		38	
9		19			2	9		39	
10		20	PBW		3	0		40	

Notes:

LDC #: 27649B4

VALIDATION FINDINGS WORKSHEET Sample Specific Element Reference

Page:_	of
Reviewer:	MG
2nd reviewer:	

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1->4	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn) Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ⁻ ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
Tip.		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
	·	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN-,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN ,
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
		Analysis Method.
ICP	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mp, Hg(Ni, K, Se, Ag, Na, Tl, V, Zn), Mo, B, Si, CN,
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN,
GEAA		Al Sb As Ba Be Cd Ca Cr Co Cu Fe Pb Mg Mn Hg Ni K Se Ag Na Tl V Zn Mo B Si CN

Comments: Mercury by CVAA if performed		

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 16 through April 17, 2012

LDC Report Date: May 18, 2012

Matrix: Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45519-1

Sample Identification

JP-M11-GWMW802

JP-M11-GWMW805

JP-M11-GWMW335

JP-M11-GWMW336

JP-M9-GWMW330

JP-M9-GWMW330MS

JP-M9-GWMW330MSD

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 300.0 for Dissolved Sulfate and Dissolved Nitrate as Nitrogen.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Calibration Verification

Calibration verification frequency and analysis criteria were met.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

No field blanks were identified in this SDG.

V. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Sample Result Verification

Raw data were not reviewed for this SDG.

IX. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

X. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW

Dissolved Sulfate - Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

JOAAP-GW

Dissolved Sulfate - Laboratory Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

JOAAP-GW

Dissolved Sulfate - Field Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

Job Number: 500-45519-1

General Chemistry

Client Sample ID:

JP-M11-GWMW802

Lab Sample ID:

500-45519-2

Client Matrix:

Water

Date Sampled: 04/16/2012 1140

Date Received: 04/17/2012 1230

Analyte R	Result Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved 0).11	mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500-14	46885 Analysis Date	e: 04/18/2012	1033			
Sulfate-Dissolved 8	35	mg/L	0.90	2.0	10	300.0
Analysis Batch: 500-14	46885 Analysis Dat	e: 04/18/2012	1048			

05/08/2012

Job Number: 500-45519-1

General Chemistry

Client Sample ID:

JP-M11-GWMW805

Lab Sample ID:

500-45519-3

Client Matrix:

Water

Date Sampled: 04/16/2012 1235

Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL .	Dil	Method
Nitrate as N-Dissolved	0.22		mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 500	-146885 Ana	lysis Date	04/18/20	12 1102			
Sulfate-Dissolved	470		mg/L	9.0	20	100	300.0
Analysis Batch: 500	-146885 Ana	lysis Date	04/19/20	12 0441			

ashala

Job Number: 500-45519-1

General Chemistry

Client Sample ID:

JP-M11-GWMW335

Lab Sample ID:

500-45519-4

Client Matrix:

Water

Date Sampled: 04/16/2012 1325

Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.31		mg/L	0.023	0.10	1.0	300.0
Analysis Batch:	500-146885 A	nalysis Date:	04/18/20	12 1131			
Sulfate-Dissolved	660	1	mg/L	9.0	20	100	300.0
			0.440.00	40.0450			

Analysis Batch: 500-146885 Analysis Date: 04/19/2012 0456

025/2/12

Job Number: 500-45519-1

General Chemistry

Client Sample ID:

JP-M11-GWMW336

Lab Sample ID:

500-45519-5

Client Matrix:

Water

Date Sampled: 04/16/2012 1410

Date Received: 04/17/2012 1230

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Nitrate as N-Dissolved	0.12	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	mg/L	0.023	0.10	1.0	300.0
Analysis Batch: 50	00-146885 A	nalysis Date	: 04/18/20	12 1159			
Sulfate-Dissolved	410		mg/L	9.0	20	100	300.0
Analysis Batch: 50	00-146885 A	nalysis Date	: 04/19/20	12 0510			

aspala

Job Number: 500-45519-1 Client: Toltest Inc.

General Chemistry

Client Sample ID:

JP-M9-GWMW330

Lab Sample ID:

500-45519-6

Client Matrix:

Water

Date Sampled: 04/17/2012 1005

Date Received: 04/17/2012 1230

Analyte Sulfate-Dissolved Result 430

Qual Units

MDL RL Dil 50 Method

mg/L

4.5

10

300.0

Analysis Batch: 500-147408 Analysis Date: 04/23/2012 1705

orspala

DG#	27649B6 : 500-45519-1 tory: Test America, Inc.		IDATIOI		PLETENES: Level III	S WORKSH	IEET	2nd	Date: 5-17 Page: 1 of 1 Reviewer: MG d Reviewer:
he sa	OD: Dissolved Sulfate, I mples listed below were on findings worksheets.	e reviev		·	·	ation areas. Va	alidation fi	ndings ar	re noted in attached
	Validation	Area					Commen	ts	
I,	Technical holding times			Α	Sampling dates	: 4-16-1	12 th	rough	4-17-12
11	Initial calibration			Α				0	
111.	Calibration verification			A					
IV	Blanks			Α					
٧	Matrix Spike/Matrix Spike Do	uplicates	3	A	MS/MS	D			
VI.	Duplicates			7					
VII.	Laboratory control samples			A	LCS				
VIII.	Sample result verification			N					
IX.	Overall assessment of data			A					
X .	Field duplicates			7					
XI_	Field blanks			7					
lote:	A = Acceptable N = Not provided/applicable SW = See worksheet	•	R = Rin	o compound sate eld blank	s detected	D = Duplicate TB = Trip blar EB = Equipme	nk		
	d Samples: all water	<u> </u>							
1 J	P-M11-GWMW802	11			21		31		
1 J 2 J	P-M11-GWMW805	12			22		32		
1	P-M11-GWMW335	13			23		33		
1	P-M11-GWMW336	14			24		34		
<u>, </u>	P-M9-GWMW330	15			25		35		
21	P-M9-GWMW330MS	16			26		36		
1 1 I	IP-M9-GWMW330MSD	17			27		37		
a T		18			28		38		1

Notes:		

PBWI

ben y

LDC#: 27649B6

VALIDATION FINDINGS WORKSHEET Sample Specific Analysis Reference

Page:_	
Reviewer:	MG
2nd reviewer:	\sim

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
Sample ID		
1-34	W	pH TDS CI F(NO ₃)NO ₂ (SO ₄)PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
9C / 7		pH TDS CI F NO ₃ NO ₂ (SO ₄)PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
OC 6,7	<u> </u>	pH TDS CI F NO ₃ NO ₂ (SO ₄)PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CiO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		ph tds ci f No3 No2 SO4 PO4 ALK CN- NH3 TKN TOC CRS+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
r'		ph TDS CI F NO3 NO2 SO4 PO4 ALK CN NH3 TKN TOC CR6+ CIO4
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		ph tos ci f No ₃ No ₂ SO ₄ PO ₄ ALK CN ⁻ NH ₃ TKN TOC CR ⁶⁺ CiO ₄
		pH TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CR ⁶⁺ CIO ₄
		ph tos ci f no ₃ no ₂ so ₄ po ₄ alk cn nh ₃ tkn toc cr clo ₄
		ph TDS CI F NO ₃ NO ₂ SO ₄ PO ₄ ALK CN NH ₃ TKN TOC CK CIO ₄
		pH TDS CLF NO, NO, SO, PO, ALK CN NH, TKN TOC CR6+ CIO.

Comments:			
•			

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name: JOAAP-GW

Collection Date: April 15 through April 16, 2012

LDC Report Date: May 24, 2012

Matrix: Water

Parameters: Explosives

Validation Level: EPA Level III

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45519-1

Sample Identification

JP-M06-GWMW654

JP-M11-GWMW802

JP-M11-GWMW805

JP-M11-GWMW335

JP-M11-GWMW336

JP-M11-GWMW336MS

JP-M11-GWMW336MSD

Introduction

This data review covers 7 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Column	Compound	%D	Associated Samples	Flag	A or P
4/20/12	L3uPH	2,4,6-Trinitrotoluene	16.6	All samples in SDG 500-45519-1	J (all detects) UJ (all non-detects)	А

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation and RLs

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
JP-M06-GWMW654	RDX 3-Nitrotoluene	182.3 149.1	J (all detects) J (all detects)	А

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

No field duplicates were identified in this SDG.

JOAAP-GW Explosives - Data Qualification Summary - SDG 500-45519-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45519-1	JP-M06-GWMW654 JP-M11-GWMW802 JP-M11-GWMW805 JP-M11-GWMW335 JP-M11-GWMW336	2,4,6-Trinitrotoluene	J (all detects) UJ (all non-detects)	А	Continuing calibration (%D)
500-45519-1	JP-M06-GWMW654	RDX 3-Nitrotoluene	J (all detects) J (all detects)	А	Compound quantitation and RLs (column difference)

JOAAP-GW

Explosives - Laboratory Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

JOAAP-GW

Explosives - Field Blank Data Qualification Summary - SDG 500-45519-1

No Sample Data Qualified in this SDG

Job Number: 500-45519-1

Client Sample ID:

JP-M06-GWMW654

Lab Sample ID:

500-45519-1

04/20/2012 2249

Client Matrix:

Water

Date Sampled: 04/15/2012 1247

Date Received: 04/17/2012 1230

8330 Nitroaromatics	and Nitramines	(HPLC)	
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Analysis Method: 8330 Prep Method:

Analysis Date:

Dilution:

3535 1.0

Analysis Batch: 500-146863 Prep Batch:

500-147010

Instrument ID:

Initial Weight/Volume: 770 mL

INST39-40 6.0 mL

Final Weight/Volume: Injection Volume: Result Type:

100 uL **PRIMARY**

Prep Date:	04/19/2012 2030		Resu	ılt Type:	PRIMARY
Analyte		Result (ug/L)	Qualifier	MDL	RL
HMX	enge sega sa kanaganan kanagan kanagan basa ka sa kanagan kenagan kanagan kenagan da kanagan kenagan kenagan k	<0.31	(par perpensional perpension de la company de la company de la company de la company de la company de la compa	0.12	0.31
RDX		0.31 5		0.077	0.16
1,3,5-Trinitroben	zene	<0.16		0.039	0.16
1,3-Dinitrobenze	ne	<0.16		0.033	0.16
Nitrobenzene		<0.16		0.032	0.16
2.4.6-Trinitrotolu	ene	0.18 3		0.036	0.16
Tetryl		<0.39		0.065	0.39
2,4-Dinitrotoluen	е	1.7		0.032	0.31
2,6-Dinitrotoluen		0.97		0.071	0.31
2-Amino-4,6-dini		0.70		0.035	0.31
4-Amino-2,6-dini		2.2		0.074	0.31
4-Nitrotoluene		11		0.082	0.31
3-Nitrotoluene		0.23	J	0.14	0.31
Surrogate		%Rec	Qualifier		otance Limits
1,2-Dinitrobenze	ne	107		70 - 1	30

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID:

JP-M06-GWMW654

Lab Sample ID:

500-45519-1

04/21/2012 1104

04/19/2012 2030

Client Matrix:

Water

Date Sampled: 04/15/2012 1247

Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

DL

Analysis Method: 8330 Prep Method:

Analysis Date:

Dilution:

3535 10

Analysis Batch: Prep Batch:

Run Type:

500-147010

500-146863

Instrument ID:

INST39-40 Initial Weight/Volume: 770 mL

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

Result Type:

PRIMARY

Prep Date: Analyte

Result (ug/L)

Qualifier

MDL

RL

2-Nitrotoluene

18

0.82

3.1

Job Number: 500-45519-1 Client: Toltest Inc.

Client Sample ID:

JP-M11-GWMW802

Lab Sample ID:

500-45519-2

Client Matrix:

Water

Date Sampled: 04/16/2012 1140

Date Received: 04/17/2012 1230

8330 Nitroaromatics	and Nitramines	(HPLC)
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INST39-40 Analysis Method: 8330 Analysis Batch: 500-146863 Instrument ID: 500-147010 Initial Weight/Volume: 770 mL Prep Batch: Prep Method: 3535 Final Weight/Volume: 6.0 mL Dilution: 1.0

Injection Volume: 100 uL Analysis Date: 04/20/2012 2341 Result Type: **PRIMARY** Prep Date: 04/19/2012 2030

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1.3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16 🛷		0.036	0.16
Tetryl	<0.39		0.065	0.39
2,4-Dinitrotoluene	<0.31		0.032	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4.6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Accepta	ance Limits
1.2-Dinitrobenzene	107	**************************************	70 - 130)

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW805

Lab Sample ID:

500-45519-3

Client Matrix:

Water

Date Sampled: 04/16/2012 1235

Date Received: 04/17/2012 1230

Analysis Method: Prep Method: Dilution: Analysis Date: Prep Date:	8330 3535 1.0 04/21/2012 0108 04/19/2012 2030	Analysis Batch: Prep Batch:	500-146863 500-147010)		eight/Volume: ight/Volume: Volume:	1NST39-4 770 mL 6.0 mL 100 uL PRIMAR	
Analyte		Result (u	g/L)	Qualifie	er	MDL	RL	
HMX	ere ere ere ere ere ere ere ere ere ere	<0.31	***************************************			0.12	0.31	**************************************
RDX		<0.16				0.077	0.16	
1,3,5-Trinitrobenze	ene	<0.16				0.039	0.16	
1.3-Dinitrobenzene		<0.16				0.033	0.16	
Nitrobenzene		<0.16	_			0.032	0.16	
2,4,6-Trinitrotoluer	ne	<0.16 U	<u> </u>			0.036	0.16	
Tetryl		< 0.39				0.065	0.39	
		.0.04				0.000.	0.24	

8330 Nitroaromatics and Nitramines (HPLC)

1.2-Dinitrohenzene	98		70 - 130)
Surrogate	%Rec	Qualifier	*	ance Limits
3-Nitrotoluene	<0.31		0.14	0.31
4-Nitrotoluene	<0.31		0.082	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
2,6-Dinitrotoluene	<0.31		0.071	0.31
2,4-Dinitrotoluene	<0.31		0.032	0.31
Tetryl	<0.39		0.065	0.39
2,4,6-Trinitrotoluene	<0.16 √ 5		0.036	0.16
Nitrobenzene	<0.16		0.032	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
RDX	<0.16		0.077	0.16
1 114177				

Client: Toltest Inc.

Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW335

Lab Sample ID:

500-45519-4

Client Matrix:

Water

Date Sampled: 04/16/2012 1325

Date Received: 04/17/2012 1230

8330 Nitroaromatics	and	Nitramines	(HPLC)

Analysis Method: 8330 Prep Method:

Analysis Date:

Prep Date:

Dilution:

3535

1.0

04/21/2012 0200 04/19/2012 2030 Analysis Batch: Prep Batch:

500-146863 500-147010

Instrument ID:

Initial Weight/Volume: 770 mL

INST39-40 6.0 mL

Final Weight/Volume: Injection Volume: Result Type:

100 uL **PRIMARY**

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1.3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16 U⊃		0.036	0.16
Tetryl	<0.39		0.065	0.39
2.4-Dinitrotoluene	<0.31		0.032	0.31
2.6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4.6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Accepta	ince Limits
1,2-Dinitrobenzene	101		70 - 130)

Job Number: 500-45519-1

Client Sample ID:

JP-M11-GWMW336

Lab Sample ID:

Analysis Date:

Prep Date:

500-45519-5

Client Matrix:

Water

Date Sampled: 04/16/2012 1410

Date Received: 04/17/2012 1230

8330 Nitroaromatics	and	Nitramines	(HPLC)
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Analysis Method: 8330 Prep Method: 3535 Dilution:

1.0

04/21/2012 0251 04/19/2012 2030 Analysis Batch: Prep Batch:

500-147010

500-146863 Instrument ID:

Initial Weight/Volume: 770 mL Final Weight/Volume: 6.0 mL

Injection Volume: Result Type:

100 uL PRIMARY

INST39-40

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16 US		0.036	0.16
Tetryl	<0.39		0.065	0.39
2.4-Dinitrotoluene	<0.31		0.032	0.31
2.6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4.6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Accepta	ince Limits
1,2-Dinitrobenzene	101		70 - 130)

LDC #: 27649B40	VALIDATION COMPLETENESS WORKSHEET	Date: 5 22/12
SDG #: <u>500-45519-1</u>	Level III	Page: <u> </u> of <u> </u>
Laboratory: Test America, Inc.		Reviewer: M
		2nd Reviewer:

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
<u>l.</u>	Technical holding times	A	Sampling dates: 4/15 - 4/16/12
li	Initial calibration	A	1-RSD = 201.
111.	Calibration verification/ICV	SW	7. D = 501. ray/cer
IV.	Blanks	I A	7 1
V	Surrogate recovery	SWA	
VI.	Matrix spike/Matrix spike duplicates	AKSW	ms/D
VII.	Laboratory control samples	SWA	Les
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	SWA	
Χ.	System Performance	N	
XI.	Overall assessment of data	A	
XII.	Field duplicates	N	
XIII.	Field blanks	N	

Note:

A = Acceptable

N = Not provided/applicable SW = See worksheet

ND = No compounds detected

R = Rinsate

FB = Field blank

D = Duplicate TB = Trip blank EB = Equipment blank

WATER Validated Samples:

1	JP-M06-GWMW654	11	147010 MB	21	31	
2	JP-M11-GWMW802	12		22	32	
3	JP-M11-GWMW805	13		23	33	
4	JP-M11-GWMW335	14		24	34	
5	JP-M11-GWMW336	15		25	35	
6	JP-M11-GWMW336MS	16		26	36	
7	JP-M11-GWMW336MSD	17		27	37	
8		18		28	38	
9		19		29	39	
10		20		30	40	

Notes:_		

VALIDATION FINDINGS WORKSHEET

METHOD: GC HPLC

8310	(8330)	8151	8141	8141(Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	1. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotoluene	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Famphur	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Phosmet	
O. Phenanthrene	O. Nitroglycerin		O. Chlorpyrifos	JJ. Tetrachlorvinphos	
P. Pyrene	ď		P. Fenthion	KK. Demeton (total)	
Ġ	Ö		Q. Parathion-ethyl		
a '			R. Trichlornate		
S.			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes:_

LDC# 3777498 40

VALIDATION FINDINGS WORKSHEET Continuing Calibration

Page: of [

2nd Reviewer: (Reviewer:_

METHOD: GC HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

ON N/A Y N/A Level IV Only

Y N(N/A

Were the retention times for all calibrated compounds within their respective acceptance windows?

		Т	T	T	Т	T	T	T	T	T	Т	1	T	T	$\overline{}$	 	T	Т	T	_	$\overline{}$	┯	
Qualifications	J/145/A																						
Associated Samples	4-4 ALL																						
RT (limit)	(()	.))	(()			()		((((
%D S.D (Limit ≤ 20.0)	<u>م</u> .ما																						
Compound	O																						
Detector/ &ofumn																							1
Standard ID	4/20/12 04061240-180.4		•																		•		
Date	7 02 1																						
#		\perp																					

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VALIDATION FINDINGS WORKSHEET Compound Quantitation and Reported CRQLs

	\$2	\ \
Page: _	Reviewer:	2nd Reviewer:

METHOD: GC /HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A". Level IV/D Only

Level IV/D On ≺ N A/A

Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Did the reported results for detected target compounds agree within 10.0% of the recalculated results? Did the percent difference of detected compounds between two columns./detectors <40%?

If no, please see findings bellow.

Qualifications	J/A dute									
%D Between Two Columns/Detectors Limit (< 40%)	182.3	149.1	•							
Sample ID)	, V								
Compound Name	3	Z								
#										

Comments:

Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

JOAAP-GW

Collection Date:

April 14 through April 15, 2012

LDC Report Date:

May 25, 2012

Matrix:

Water

Parameters:

Explosives

Validation Level:

EPA Level III

Laboratory:

TestAmerica, Inc.

Sample Delivery Group (SDG): 500-45521-1

Sample Identification

JP-M06-GWMW123R

JP-M07-GWMW124R

JP-M06-GWMW162R

JP-M06-GWMW212R

JP-M06-GWMW995

JP-M06-GWMW313

JP-M06-GWMW318

JP-M06-GWMW319

JP-M06-GWMW652

JP-M06-GWMW994

Introduction

This data review covers 10 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8330 for Explosives.

This review follows the Joliet Army Ammunition Plant (JOAAP) Quality Assurance Project Plan (QAPP) for Long Term Monitoring, prepared by MWH Americas, Inc. (Rev. 0 July 2009), the U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 4.1 (April 2009), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at the required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 20.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds.

IV. Blanks

Method blanks were reviewed for each matrix as applicable. No explosive contaminants were found in the method blanks.

No field blanks were identified in this SDG.

V. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
JP-M06-GWMW318	1,2-Dinitrobenzene	201 (54-148)	All TCL compounds	J (all detects)	Р

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Target Compound Identification

Raw data were not reviewed for this SDG.

IX. Compound Quantitation and RLs

The sample results for detected compounds from the two columns were within 40% difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
JP-M06-GWMW162R	2,4-Dinitrotoluene	113.0	J (all detects)	А
JP-M06-GWMW212R	4-Amino-2,6-dinitrotoluene 2-Amino-4,6-dinitrotoluene	61.5 60.2	J (all detects) J (all detects)	А
JP-M06-GWMW318	2,6-Dinitrotoluene 2,4-Dinitrotoluene	146.1 176.1	J (all detects) J (all detects)	А
JP-M06-GWMW319	2,4,6-Trinitrotoluene	129.6	J (all detects)	А
JP-M06-GWMW652	4-Amino-2,6-dinitrotoluene	67.5	J (all detects)	А
JP-M06-GWMW994	4-Amino-2,6-dinitrotoluene 4-Nitrotoluene	71.9 57.2	J (all detects) J (all detects)	А

Raw data were not reviewed for this SDG.

X. System Performance

Raw data were not reviewed for this SDG.

XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XII. Field Duplicates

Samples JP-M06-GWMW123R and JP-M06-GWMW995 and samples JP-M06-GWMW652 and JP-M06-GWMW994 were identified as field duplicates. No explosives were detected in any of the samples with the following exceptions:

	Concentra	ition (ug/L)				
Compound	JP-M06-GWMW652	JP-M06-GWMW994	RPD (Limits)	Difference (Limits)	Flags	A or P
1,3-Dinitrobenzene	9.5	7.9	-	1.6 (≤80)	-	-
2,4,6-Trinitrotoluene	1600	1300	21 (≤25)	-	-	-
2,4-Dinitrotoluene	8400	6800	21 (≤25)	-	-	-
2,6-Dinitrotoluene	3300	2700	20 (≤25)	_	-	-
2-Amino-4,6-dinitrotoluene	360	320	12 (≤25)	-	-	_
4-Amino-4,6-dinitrotoluene	380	320	17 (≤25)	-	-	-
2-Nitrotoluene	44000	35000	23 (≤25)	-	-	-
4-Nitrotoluene	28000	22000	24 (≤25)	-	-	-

JOAAP-GW Explosives - Data Qualification Summary - SDG 500-45521-1

SDG	Sample	Compound	Flag	A or P	Reason
500-45521-1	JP-M06-GWMW318	All TCL compounds	J (all detects)	Р	Surrogate spikes (%R)
500-45521-1	JP-M06-GWMW162R	2,4-Dinitrotoluene	J (all detects)	А	Compound quantitation and RLs (%D)
500-45521-1	JP-M06-GWMW212R	4-Amino-2,6-dinitrotoluene 2-Amino-4,6-dinitrotoluene	J (all detects) J (all detects)	Α	Compound quantitation and RLs (%D)
500-45521-1	JP-M06-GWMW318	2,6-Dinitrotoluene 2,4-Dinitrotoluene	J (all detects) J (all detects)	Α	Compound quantitation and RLs (%D)
500-45521-1	JP-M06-GWMW319	2,4,6-Trinitrotoluene	J (all detects)	Α	Compound quantitation and RLs (%D)
500-45521-1	JP-M06-GWMW652	4-Amino-2,6-dinitrotoluene	J (all detects)	А	Compound quantitation and RLs (%D)
500-45521-1	JP-M06-GWMW994	4-Amino-2,6-dinitrotoluene 4-Nitrotoluene	J (all detects) J (all detects)	A	Compound quantitation and RLs (%D)

JOAAP-GW

Explosives - Laboratory Blank Data Qualification Summary - SDG 500-45521-1

No Sample Data Qualified in this SDG

JOAAP-GW

Explosives - Field Blank Data Qualification Summary - SDG 500-45521-1

No Sample Data Qualified in this SDG

Job Number: 500-45521-1 Client: Toltest Inc.

JP-M06-GWMW123R Client Sample ID:

Lab Sample ID: 500-45521-1

Date Sampled: 04/14/2012 1000 Date Received: 04/17/2012 1230 Water Client Matrix:

Olient Matrix.	valei				5415 110	30.104.0
		8330 Nitroaromatics	and Nitramin	es (HPI	LC)	
Analysis Method: Prep Method: Dilution: Analysis Date: Prep Date:	8330 3535 1.0 05/03/2012 1949 04/19/2012 1030	Analysis Batch: Prep Batch:	500-148612 500-146956	 	Instrument ID: Initial Weight/Volume: Final Weight/Volume: Injection Volume: Result Type:	INST39-40 770 mL 6.0 mL 100 uL PRIMARY
Analyte		Result (u	ıg/L) (Qualifier	r MDL	RL
HMX		<0.31	40.000.000.000.000.000.000.000.000.000.	ur, e proposition de la company de la company de la company de la company de la company de la company de la co	0.12	0.31
RDX		<0.16			0.077	0.16
1,3,5-Trinitrobenze	ene	<0.16			0.039	0.16
1,3-Dinitrobenzene		<0.16			0.033	0.16
Nitrobenzene		<0.16	<0.16		0.032	0.16
2,4,6-Trinitrotoluer	ne	<0.16	<0.16		0.036	0.16
Tetryl		< 0.39			0.065	0.39
2,4-Dinitrotoluene		<0.31			0.032	0.31
2,6-Dinitrotoluene		< 0.31			0.071	0.31
2-Amino-4,6-dinitro	otoluene	<0.31			0.035	0.31
4-Amino-2,6-dinitro	otoluene	<0.31			0.074	0.31
2-Nitrotoluene		<0.31			0.082	0.31
4-Nitrotoluene		<0.31			0.082	0.31
3-Nitrotoluene		<0.31			0.14	0.31
Surrogate		%Rec	(Qualifier	- Acceptar	nce Limits
1,2-Dinitrobenzene		98			70 - 130	

Job Number: 500-45521-1

Client: Toltest Inc.

Client Sample ID: JP-M07-GWMW124R

Lab Sample ID:

500-45521-2

Client Matrix:

Water

Date Sampled: 04/14/2012 1138 Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)								
Analysis Method: Prep Method: Dilution: Analysis Date: Prep Date:	8330 3535 1.0 05/03/2012 2041 04/19/2012 1030	535 Prep Batch: .0 5/03/2012 2041		Init Fin Inje	trument ID: ial Weight/Volume: al Weight/Volume: ection Volume: sult Type:			
Analyte		Result (u	g/L) (Qualifier	MDL	RL		
HMX	er monocens de la viva de la sensión de la company de la c	<0.31		***************************************	0.12	0.31		
RDX		<0.16			0.077	0.16		
1,3,5-Trinitrobenze			<0.16		0.039	0.16		
1,3-Dinitrobenzene		<0.16	<0.16		0.033	0.16		
Nitrobenzene	•	<0.16	<0.16		0.032	0.16		
2,4,6-Trinitrotoluer	ne	<0.16	<0.16		0.036	0.16		
Tetryl		< 0.39			0.065	0.39		
2,4-Dinitrotoluene		< 0.31			0.032	0.31		
2,6-Dinitrotoluene		< 0.31			0.071	0.31		
2-Amino-4,6-dinitro	otoluene	<0.31	<0.31		0.035	0.31		
4-Amino-2,6-dinitro		<0.31			0.074	0.31		
2-Nitrotoluene		< 0.31			0.082	0.31		
4-Nitrotoluene		<0.31			0.082	0.31		
3-Nitrotoluene		<0.31			0.14	0.31		
Surrogate		%Rec	(Qualifier	Acceptai	nce Limits		
1,2-Dinitrobenzene	anno anno anno anno anno anno anno anno				70 - 130	70 - 130		

ces/30/12

Job Number: 500-45521-1

Client: Toltest Inc.

Client Sample ID: JP-M06-GWMW162R

Lab Sample ID:

500-45521-3

05/03/2012 2132

04/19/2012 1030

Client Matrix:

Water

Date Sampled: 04/14/2012 1045

Date Received: 04/17/2012 1230

Analysis Method: 8330 Prep Method:

Analysis Date:

Prep Date:

Dilution:

3535 1.0

Analysis Batch: Prep Batch:

500-148612 500-146956

Instrument ID: Initial Weight/Volume:

INST39-40 770 mL

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

Result Type:

PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31	PERSONALIS CONTRACTOR	0.12	0.31
RDX	<0.16		0.077	0.16
1,3,5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2,4,6-Trinitrotoluene	<0.16		0.036	0.16
etryl	< 0.39		0.065	0.39
2.4-Dinitrotoluene	0.27	J	0.032	0.31
2,6-Dinitrotoluene	0.14	J	0.071	0.31
-Amino-4,6-dinitrotoluene	<0.31		0.035	0.31
Amino-2,6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	0.70		0.082	0.31
-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Accepta	ince Limits
1,2-Dinitrobenzene	104		70 - 130)

aspokr

Client: Toltest Inc. Job Number: 500-45521-1

Client Sample ID: JP-M06-GWMW212R

Lab Sample ID: 500-45521-4 Date Sampled: 04/15/2012 1105

Client Matrix: Water Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: 8330 Analysis Batch: 500-148612 Instrument ID: INST39-40
Prep Method: 3535 Prep Batch: 500-146956 Initial Weight/Volume: 770 mL
Dilution: 10 Final Weight/Volume: 6.0 mL

 Dilution:
 10
 Final Weight Volume:
 6.0 ML

 Analysis Date:
 05/03/2012 2224
 Injection Volume:
 100 uL

 Prep Date:
 04/19/2012 1030
 Result Type:
 PRIMARY

RL MDL Result (ug/L) Qualifier Analyte 3.1 1.2 <3.1 HMX 0.77 1.6 <1.6 RDX 0.39 1.6 1,3,5-Trinitrobenzene <1.6 1.6 0.33 1.1 1.3-Dinitrobenzene 0.32 1.6 1.9 Nitrobenzene 39 0.36 1.6 2,4,6-Trinitrotoluene 0.65 3.9 <3.9 Tetryl 0.35 3.1 2-Amino-4,6-dinitrotoluene 64 🍮 51 J 0.74 3.1 4-Amino-2,6-dinitrotoluene 3.1 1.4 3-Nitrotoluene <3.1

Surrogate %Rec Qualifier Acceptance Limits
1,2-Dinitrobenzene 71 70 - 130

CRS/30/12

Date Sampled: 04/15/2012 1105

INST39-40

Instrument ID:

Job Number: 500-45521-1 Client: Toltest Inc.

Client Sample ID: JP-M06-GWMW212R

Lab Sample ID: 500-45521-4

Date Received: 04/17/2012 1230 Water Client Matrix:

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Batch: 500-148612 Analysis Method: 8330

500-146956 Initial Weight/Volume: 770 mL Prep Method: 3535 Prep Batch: Final Weight/Volume: 100

6.0 mL Dilution: Injection Volume: 100 uL Run Type: DL Analysis Date: 05/03/2012 2315

PRIMARY Result Type: Prep Date: 04/19/2012 1030

RL Result (ug/L) Qualifier MDL Analyte 3.2 31 620 2,4-Dinitrotoluene 31 7.1 260 2,6-Dinitrotoluene

aspola

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID:

JP-M06-GWMW212R

Lab Sample ID:

500-45521-4

Client Matrix:

Water

Date Sampled: 04/15/2012 1105

Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:

8330

Analysis Batch:

500-148612

Instrument ID:

INST39-40

Prep Method:

3535

Prep Batch:

500-146956

Initial Weight/Volume:

770 mL

Dilution:

500

Final Weight/Volume:

6.0 mL

Analysis Date:

Run Type:

DL2

Injection Volume: Result Type:

100 uL

Prep Date:

05/04/2012 0007 04/19/2012 1030

Result (ug/L)

MDL Qualifier

PRIMARY

RL

Analyte 2-Nitrotoluene 4-Nitrotoluene

4100 2100 41 41 160 160

aspokr

0.31

0.082

Client: Toltest Inc. Job Number: 500-45521-1

Client Sample ID: JP-M06-GWMW995

Lab Sample ID: 500-45521-5 Date Sampled: 04/14/2012 1200

Client Matrix: Water Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

500-148612 Instrument ID: INST39-40 Analysis Method: 8330 Analysis Batch: Initial Weight/Volume: Prep Method: 3535 Prep Batch: 500-146956 770 mL Dilution: 1.0 Final Weight/Volume: 6.0 mL Injection Volume: 100 uL Analysis Date: 05/04/2012 0059 **PRIMARY** Result Type: Prep Date: 04/19/2012 1030

Qualifier MDL RL Result (ug/L) Analyte 0.12 0.31 HMX < 0.31 0.077 0.16 RDX < 0.16 0.039 0.16 1,3,5-Trinitrobenzene < 0.16 0.16 0.033 1.3-Dinitrobenzene < 0.16 0.16 0.032 < 0.16 Nitrobenzene 0.16 0.036 < 0.16 2,4,6-Trinitrotoluene 0.065 0.39 < 0.39 Tetryl 0.31 2,4-Dinitrotoluene < 0.31 0.032 0.31 2.6-Dinitrotoluene < 0.31 0.071 2-Amino-4,6-dinitrotoluene < 0.31 0.035 0.31 4-Amino-2,6-dinitrotoluene < 0.31 0.074 0.31 0.31 2-Nitrotoluene < 0.31 0.082

 3-Nitrotoluene
 <0.31</th>
 0.14
 0.31

 Surrogate
 %Rec
 Qualifier
 Acceptance Limits

 1,2-Dinitrobenzene
 104
 70 - 130

< 0.31

025/30/12

4-Nitrotoluene

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID:

JP-M06-GWMW313

Lab Sample ID:

500-45521-6

Client Matrix:

Water

Date Sampled: 04/15/2012 1326

Date Received: 04/17/2012 1230

8330 Nitroa	romatics and	Nitramines	(HPLC)
OJJU INILIUA	i villaticə alik		1111

Analysis Method: 8330 Prep Method: 3535 Analysis Batch:

500-148612

Instrument ID:

INST39-40

Dilution:

1.0

Prep Batch: 500-146956

Final Weight/Volume:

Initial Weight/Volume: 770 mL 6.0 mL

Analysis Date: Prep Date:

05/04/2012 0242 04/19/2012 1030 Injection Volume: Result Type:

100 uL **PRIMARY**

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.31		0.12	0.31
RDX	<0.16		0.077	0.16
1.3.5-Trinitrobenzene	<0.16		0.039	0.16
1,3-Dinitrobenzene	<0.16		0.033	0.16
Nitrobenzene	<0.16		0.032	0.16
2.4.6-Trinitrotoluene	<0.16		0.036	0.16
Tetryl	<0.39		0.065	0.39
2.4-Dinitrotoluene	<0.31		0.032	0.31
2.6-Dinitrotoluene	<0.31		0.071	0.31
2-Amino-4.6-dinitrotoluene	<0.31		0.035	0.31
4-Amino-2.6-dinitrotoluene	<0.31		0.074	0.31
2-Nitrotoluene	<0.31		0.082	0.31
4-Nitrotoluene	<0.31		0.082	0.31
3-Nitrotoluene	<0.31		0.14	0.31
Surrogate	%Rec	Qualifier	Acceptance L	imits
1,2-Dinitrobenzene	96		70 - 130	

025/30/r

Job Number: 500-45521-1

Client: Toltest Inc.

Client Sample ID: JP-M06-GWMW318

Lab Sample ID:

500-45521-7

05/04/2012 0334

04/19/2012 1030

Client Matrix:

Water

Date Sampled: 04/14/2012 1300 Date Received: 04/17/2012 1230

8330	Nitr	oar	om	atics	s and	Nitramines	(HPLC)
	_		_			140040	1

Analysis Method: 8330 Prep Method:

Analysis Date:

Prep Date:

Dilution:

3535

2.0

Analysis Batch: Prep Batch:

500-148612 500-146956 Instrument ID:

INST39-40 Initial Weight/Volume: 770 mL Final Weight/Volume:

Injection Volume: Result Type:

6.0 mL 100 uL **PRIMARY**

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.62		0.24	0.62
RDX	<0.32		0.15	0.32
1,3,5-Trinitrobenzene	<0.32		0.078	0.32
1,3-Dinitrobenzene	< 0.32		0.066	0.32
Nitrobenzene	<0.32		0.064	0.32
2,4,6-Trinitrotoluene	<0.32		0.072	0.32
Tetryl	<0.78		0.13	0.78
2,4-Dinitrotoluene	0.21 ろ	J	0.064	0.62
2,6-Dinitrotoluene	0.45 ブ	J	0.14	0.62
2-Amino-4,6-dinitrotoluene	<0.62		0.070	0.62
4-Amino-2,6-dinitrotoluene	<0.62		0.15	0.62
2-Nitrotoluene	<0.62		0.16	0.62
4-Nitrotoluene	<0.62		0.16	0.62
3-Nitrotoluene	<0.62		0.27	0.62
Surrogate	%Rec	Qualifier	Acceptano	ce Limits
1,2-Dinitrobenzene	201	X	70 - 130	

025/30/R

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID:

JP-M06-GWMW319

Lab Sample ID:

500-45521-8

Client Matrix:

Water

Date Sampled: 04/14/2012 1225

Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramin

Analysis Method: Prep Method:

8330 3535

2.0

Analysis Date: Prep Date:

Dilution:

05/04/2012 0425 04/19/2012 1030 Analysis Batch: Prep Batch:

500-148612 500-146956

Instrument ID:

Initial Weight/Volume: 770 mL Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

Result Type:

PRIMARY

INST39-40

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<0.62	**************************************	0.24	0.62
RDX	<0.32		0.15	0.32
1,3,5-Trinitrobenzene	<0.32		0.078	0.32
1.3-Dinitrobenzene	<0.32		0.066	0.32
Nitrobenzene	<0.32		0.064	0.32
2.4.6-Trinitrotoluene	0.29 ブ	J	0.072	0.32
Tetryl	<0.78		0.13	0.78
2.4-Dinitrotoluene	<0.62		0.064	0.62
2,6-Dinitrotoluene	<0.62		0.14	0.62
2-Amino-4,6-dinitrotoluene	<0.62		0.070	0.62
4-Amino-2,6-dinitrotoluene	<0.62		0.15	0.62
2-Nitrotoluene	<0.62		0.16	0.62
4-Nitrotoluene	<0.62		0.16	0.62
3-Nitrotoluene	<0.62		0.27	0.62
Surrogate	%Rec	Qualifier	Accepta	ance Limits
1,2-Dinitrobenzene	100		70 - 130)

Job Number: 500-45521-1 Client: Toltest Inc.

Client Sample ID:

JP-M06-GWMW652

Lab Sample ID:

500-45521-9

Client Matrix:

Water

Date Sampled: 04/14/2012 1355

Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: Prep Method:

8330 3535

100

Analysis Date: Prep Date:

Dilution:

05/04/2012 0608 04/19/2012 1030 Analysis Batch: 500-148612 Prep Batch:

500-146956

Instrument ID:

INST39-40 Initial Weight/Volume: 770 mL

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

Result Type:

PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL	
HMX	<31		12	31	
RDX	<16		7.7	16	
1,3,5-Trinitrobenzene	<16		3.9	16	
1,3-Dinitrobenzene	9.5	j	3.3	16	
Nitrobenzene	<16		3.2	16	
Tetryl	<39		6.5	39	
2-Amino-4,6-dinitrotoluene	360		3.5	31	
4-Amino-2,6-dinitrotoluene	380 5		7.4	31	
3-Nitrotoluene	<31		14	31	
Surrogate	%Rec	Qualifier	Accept	ance Limits	

Surrogate 70 - 130 1,2-Dinitrobenzene

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID:

JP-M06-GWMW652

Lab Sample ID:

500-45521-9

04/19/2012 1030

Client Matrix:

Water

Date Sampled: 04/14/2012 1355

Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:

8330 3535 Analysis Batch: Prep Batch:

500-148612

Instrument ID:

INST39-40

Prep Method: Dilution:

500

500-146956

Initial Weight/Volume: Final Weight/Volume:

770 mL 6.0 mL

Analysis Date: Prep Date:

05/04/2012 0700

Run Type:

DL

Injection Volume: Result Type:

100 uL **PRIMARY**

Analyte 2,4,6-Trinitrotoluene 2,6-Dinitrotoluene

Result (ug/L) 1600 3300

MDL Qualifier 18 36

RL80 160

aspola

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID:

JP-M06-GWMW652

Lab Sample ID:

500-45521-9

04/19/2012 1030

Client Matrix:

Water

Date Sampled: 04/14/2012 1355

Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:

8330 3535 Analysis Batch: Prep Batch:

500-148612

Instrument ID:

INST39-40

Prep Method: Dilution:

Prep Date:

2000

500-146956

Initial Weight/Volume: 770 mL

Analysis Date:

05/04/2012 1304

Run Type:

DL2

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

Result Type:

PRIMARY

Qualifier MDL RL Result (ug/L) Analyte 620 64 8400 2,4-Dinitrotoluene 160 620 28000 4-Nitrotoluene

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID:

JP-M06-GWMW652

Lab Sample ID:

500-45521-9

Client Matrix:

Water

Date Sampled: 04/14/2012 1355

Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: Prep Method:

8330 3535 Analysis Batch: Prep Batch:

500-148612 500-146956

Instrument ID:

INST39-40 Initial Weight/Volume: 770 mL

6.0 mL

Dilution: Analysis Date: 10000

05/07/2012 1331 04/19/2012 1030 Run Type:

DL3

Final Weight/Volume: Injection Volume:

100 uL

Result Type:

PRIMARY

Analyte

Result (ug/L)

Qualifier

MDL

RL

2-Nitrotoluene

Prep Date:

44000

820

3100

CES/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID:

JP-M06-GWMW994

Lab Sample ID:

500-45521-10

Client Matrix:

Water

Date Sampled: 04/14/2012 1200

Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: Prep Method:

8330 3535 Prep Batch:

Analysis Batch: 500-148612

Instrument ID:

INST39-40

Dilution:

100

500-146956

Initial Weight/Volume: 770 mL Final Weight/Volume:

6.0 mL

Analysis Date: Prep Date:

05/04/2012 0843

04/19/2012 1030

Injection Volume: Result Type:

100 uL **PRIMARY**

Analyte	Result (ug/L)	Qualifier	MDL	RL
HMX	<31	***************************************	12	31
RDX	<16		7.7	16
1,3,5-Trinitrobenzene	<16		3.9	16
1.3-Dinitrobenzene	7.9	J	3.3	16
Nitrobenzene	<16		3.2	16
Tetryl	<39		6.5	39
2-Amino-4,6-dinitrotoluene	320		3.5	31
4-Amino-2,6-dinitrotoluene	320 5		7.4	31
3-Nitrotoluene	<31		14	31
Curromoto	%Rec	Qualifier	Accepta	ance Limits

Surrogate %Rec Qualifier 70 - 130 D Õ 1,2-Dinitrobenzene

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID:

JP-M06-GWMW994

Lab Sample ID:

500-45521-10

Client Matrix:

Water

Date Sampled: 04/14/2012 1200

Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: Prep Method:

8330 3535 Analysis Batch:

500-148612

Instrument ID:

INST39-40

Dilution:

500

Prep Batch:

500-146956

Initial Weight/Volume: 770 mL

Analysis Date:

Run Type:

Injection Volume:

Final Weight/Volume: 6.0 mL 100 uL

Prep Date:

05/04/2012 0935 04/19/2012 1030 DL

Result Type:

PRIMARY

Analyte	Result (ug/L)	Qualifier	MDL	RL
2,4,6-Trinitrotoluene	1300	······································	18	80
2,6-Dinitrotoluene	2700		36	160

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID:

JP-M06-GWMW994

Lab Sample ID:

500-45521-10

Client Matrix:

Water

Date Sampled: 04/14/2012 1200

Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: 8330 Prep Method:

3535

Analysis Batch: Prep Batch:

500-148612 500-146956

Instrument ID:

INST39-40 Initial Weight/Volume: 770 mL

Dilution: Analysis Date: 1000 05/04/2012 1209

Run Type:

DL2

Final Weight/Volume:

6.0 mL

Injection Volume: 100 uL **PRIMARY** Result Type:

Prep Date:

04/19/2012 1030

Result (ug/L)

Qualifier

MDL 32

RL

Analyte 2,4-Dinitrotoluene

6800

310

Ces/30/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID:

JP-M06-GWMW994

Lab Sample ID:

500-45521-10

04/19/2012 1030

Client Matrix:

Water

Date Sampled: 04/14/2012 1200

Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method:

8330 3535 Analysis Batch: Prep Batch:

500-146956

500-148612

Instrument ID:

INST39-40 Initial Weight/Volume: 770 mL

Prep Method: Dilution: Analysis Date:

2000 05/04/2012 1355

Run Type:

DL3

Final Weight/Volume: Injection Volume:

6.0 mL 100 uL

Result Type:

PRIMARY

Analyte

Prep Date:

Result (ug/L)

Qualifier

MDL

RL

4-Nitrotoluene

22000 3

160

620

025/35/12

Client: Toltest Inc.

Job Number: 500-45521-1

Client Sample ID:

JP-M06-GWMW994

Lab Sample ID:

500-45521-10

Client Matrix:

Water

Date Sampled: 04/14/2012 1200

Date Received: 04/17/2012 1230

8330 Nitroaromatics and Nitramines (HPLC)

Analysis Method: 8330 Prep Method:

3535

Analysis Batch:

500-148612

Instrument ID: Initial Weight/Volume:

INST39-40 770 mL

Dilution:

5000

Prep Batch:

500-146956

Final Weight/Volume:

6.0 mL

Analysis Date: Prep Date:

05/07/2012 1515

Run Type:

DL4

Injection Volume: Result Type:

100 uL PRIMARY

Analyte

04/19/2012 1030

Result (ug/L)

Qualifier

MDL

2-Nitrotoluene

35000

410

RL 1600

N = Not provided/applicable R = Rinsate TB = Trip blank SW = See worksheet FB = Field blank EB = Equipment blank	SDG # Labora METH The sa	27649C40 : 500-45521-1 ttory: Test America, Inc. OD: HPLC Explosives (mples listed below were on findings worksheets	EPA S	SW 846 Me	thod 8330	_evel III	l	SS WORKSHEE		Date: 5 23 Page: 1 of 1 Reviewer: 14 2nd Reviewer: 1
I. Technical holding times II. Initial calibration A. I. R. SD \(\frac{1}{2} \) 20. III. Calibration verification/ICV A. I. R. SD \(\frac{1}{2} \) 20. IV. Blanks V. Surrogate recovery VI. Matrix spike/Matrix spike duplicates VII. Laboratory control samples VIII. Target compound identification IX. Compound quantitation/RL/LOQ/LODs X. System Performance XI. Overall assessment of data XII. Field duplicates XIII. Field duplicates SW FD = 1, 7 FD = 11, 15 XIII. Field blanks ND = No compounds detected N = Rinsate N =		Validation	Area					Con	nments	
II	1.				A	Sampling	dε		- 4/	15/12
III. Calibration verification/ICV A 7-D = 201. ICM cer/ V Surrogate recovery VI. Matrix spike/Matrix spike duplicates VII. Laboratory control samples VIII. Target compound identification IX. Compound quantitation/RL/LOQ/LODS X. System Performance XI. Overall assessment of data XII. Field duplicates XIII. Field blanks ND = No compounds detected N = Acceptable N = Not provided/applicable SW = See worksheet ND = No compounds detected R = Rinsate FB = Field blank FB = Field blank FB = Field blank Validated Samples: 1 JP-M06-GWMW123R 11 JP-M06-GWMW652 21 JP-M07-GWMW124R 22 JP-M07-GWMW124R 23 JP-M07-GWMW124R 24 JP-M07-GWMW124R 25 JP-M07-GWMW124R 26 JP-M07-GWMW124R 27 JP-M07-GWMW124R 27 JP-M07-GWMW124R 28 JP-M07-GWMW124R 29 JP-M07-GWMW124R 20 JP-M07-			•••••							
IV. Blanks	III.	Calibration verification/ICV			A					
VII. Laboratory control samples VIII. Target compound identification IX. Compound quantitation/RL/LOQ/LODs X. System Performance XI. Overall assessment of data XII. Field duplicates XIII. Field blanks Note: A = Acceptable N = Rinsate SW = FB = Field blank SW = See worksheet ND = No compounds detected R = Rinsate SW = FB = Field blank Validated Samples: 1 JP-M06-GWMW123R 11 JP-M06-GWMW652 21 JP-M07-GWMW124R 12 JP-M06-GWMW652 22 32	IV.	Blanks			À			, , , , , , , , , , , , , , , , , , , ,		
VIII. Laboratory control samples VIII. Target compound identification IX. Compound quantitation/RL/LOQ/LODs XX. System Performance IX. Overall assessment of data XII. Field duplicates XIII. Field blanks Note: A = Acceptable N = Not provided/applicable SW = See worksheet ND = No compounds detected N = Not provided/applicable SW = See worksheet ND = No compounds detected N = R = Rinsate R = Rinsate FB = Field blank EB = Equipment blank Validated Samples: 1 JP-M06-GWMW123R 11 JP-M06-GWMW652 2 JP-M07-GWMW124R 12 JP-M08-GWMW852Dt 2 JP-M07-GWMW124R 12 JP-M08-GWMW852Dt 2 JP-M07-GWMW124R 13 JP-M08-GWMW852Dt 2 JP-M07-GWMW124R 14 JP-M08-GWMW852Dt 2 JP-M07-GWMW124R 31	V	Surrogate recovery			W2					
VIII. Target compound identification IX. Compound quantitation/RL/LOQ/LODs X. System Performance XI. Overall assessment of data XII. Field duplicates XIII. Field blanks ND = No compounds detected N = Not provided/applicable N = Not provided/applicable SW = See worksheet ND = No compounds detected R = Rinsate R = Rinsate FB = Field blank EB = Equipment blank Validated Samples: 1 JP-M06-GWMW123R 1 JP-M06-GWMW652 2 JP-M07-GWMW124R 1 JP-M06-GWMW852Dt 2 JP-M07-GWMW124R 1 JP-M06-GWMW852Dt 2 JP-M07-GWMW124R 1 JP-M06-GWMW852Dt 2 JP-M07-GWMW124R 1 JP-M06-GWMW852Dt 2 JP-M07-GWMW124R 1 JP-M06-GWMW852Dt 2 JP-M07-GWMW124R 1 JP-M06-GWMW852Dt 2 JP-M07-GWMW124R 1 JP-M06-GWMW852Dt 2 JP-M07-GWMW124R 1 JP-M06-GWMW852Dt 2 JP-M07-GWMW124R 1 JP-M06-GWMW852Dt 2 JP-M07-GWMW124R 1 JP-M06-GWMW852Dt 2 JP-M07-GWMW124R 1 JP-M06-GWMW852Dt 2 JP-M07-GWMW124R 2 JP-M07-GWMW124R 2 JP-M07-GWMW852Dt 3 JP-M07-GWMW852Dt 4 JP-M0	VI.	Matrix spike/Matrix spike du	plicate	s	N					
IX. Compound quantitation/RL/LOQ/LODs X. System Performance XI. Overall assessment of data XII. Field duplicates XIII. Field blanks Note: A = Acceptable N = Not provided/applicable SW = See worksheet N = Not provided/applicable SW = FB = Field blank Validated Samples: 1 JP-M06-GWMW123R 1 JP-M06-GWMW652 2 JP-M07-GWMW124R 1 JP-M06-GWMW652Dt 2 JP-M07-GWMW124R 1 JP-M06-GWMW652Dt 2 JP-M07-GWMW124R 1 JP-M06-GWMW652Dt 2 JP-M07-GWMW124R 2 JP-M07-GWMW124R 1 JP-M06-GWMW652Dt 2 JP-M07-GWMW124R 3 JP-M08-GWMW652Dt 3 JP-M07-GWMW124R 3 JP-M08-GWMW652Dt 3 JP-M07-GWMW124R 3 JP-M08-GWMW652Dt 3 JP-M08-GWMW124R 3 JP-M08-GWMW124R 3 JP-M08-GWMW652Dt 3 JP-M08-GWMW124R 3 JP-M08-GWMW852Dt 4 JP-M08-GWMW852Dt 3 JP-M08-GWMW124R 3 JP-M08-GWMW852Dt 3 JP-M08-GWMW852Dt 3 JP-M08-GWMW852Dt 4 JP-M08-GWMW852Dt 3 JP-M08-GWMW852Dt 3 JP-M08-GWMW852Dt 3 JP-M08-GWMW852Dt 3 JP-M08-GWMW852Dt 4 JP-M08-GWMW852Dt 5 JP	VII.	Laboratory control samples			ASW	LCS/D				
X. System Performance XI. Overall assessment of data XII. Field duplicates XIII. Field blanks Note: A = Acceptable N = Not provided/applicable SW = See worksheet Note: Note: A = Reinsate FB = Field blank Note: A = Reinsate FB = Field blank SW = See worksheet 1 JP-M06-GWMW123R 1 JP-M06-GWMW652 2 JP-M07-GWMW124R 1 JP-M06-GWMW652 2 JP-M07-GWMW124R 1 JP-M08-GWMW852Dt 2 JP-M07-GWMW124R 2 JP-M08-GWMW124R 2 JP-M08-GWMW124R 2 JP-M08-GWMW852Dt 2 JP-M07-GWMW124R 2 JP-M08-GWMW124R 3 JP-M08-GWMW852Dt 3 JP-M08-GWMW124R 3 JP-M08-GWMW124R 3 JP-M08-GWMW852Dt 4 JP-M08-GWMW124R 3 JP-M08-GWMW124R 4 JP-M08-GWMW852Dt 4 JP-M08-GWMW124R 4 JP-M08-GWMW124R 4 JP-M08-GWMW124R 4 JP-M08-GWMW124R 4 JP-M08-GWMW852Dt 4 JP-M08-GWMW124R 4 JP-M08-GWMW852Dt 4 JP-M08-GWMW124R 4 JP-M08-GWMW124R 4 JP-M08-GWMW124R 4 JP-M08-GWMW852Dt 4 JP-M08-GWMW124R 4 JP-M08-GWMW852Dt 4 JP-M08-GWMW124R 4 JP-M08-GWMW852Dt 4 JP-M08-GWMW124R 4 JP-M08-GWMW852Dt 4 JP-M08-GWMW124R 4 JP-M08-GWMW852Dt 4 JP-M08-GWMW124R 4 JP-M08-GWMW852Dt 4 JP-M08	VIII.	Target compound identificat	ion		N	ļ				
XII. Field duplicates XIII. Field duplicates XIII. Field blanks Note: A = Acceptable N = Not provided/applicable SW = See worksheet 1 JP-M06-GWMW123R 1 JP-M06-GWMW124R 1 JP-M06-GWMW124R 1 JP-M06-GWMW652 2 JP-M07-GWMW124R 1 JP-M06-GWMW652 2 JP-M07-GWMW124R 1 JP-M06-GWMW652 2 JP-M07-GWMW124R 3 JP-M06-GWMW652 3 JP-M07-GWMW124R 3 JP-M06-GWMW652 3 JP-M07-GWMW124R 3 JP-M06-GWMW652 3 JP-M07-GWMW124R 3 JP-M06-GWMW652 3 JP-M07-GWMW124R 3 JP-M06-GWMW652 4 JP-M06-GWMW652 4 JP-M07-GWMW124R 4 JP-M06-GWMW652 4 JP-M07-GWMW124R 4 JP-M06-GWMW652 4 JP-M07-GWMW124R 4 JP-M06-GWMW652 4 JP-M07-GWMW124R 4 JP-M06-GWMW652 4 JP-M07-GWMW124R 4 JP-M06-GWMW652 4 JP-M07-GWMW124R 4 JP-M06-GWMW652 4 JP-M07-GWMW124R 4 JP-M06-GWMW652 4 JP-M07-GWMW124R 4 JP-M06-GWMW652 4 JP-M07-GWMW124R 4 JP-M06-GWMW652 4 JP-M07-GWMW124R 4 JP-M07-GWMW652 4 JP-M07-GWMW652 4 JP-M07-GWMW124R 4 JP-M07-GWMW652	IX.	Compound quantitation/RL/	LOQ/L	ODs	SWA					
XII. Field duplicates XIII. Field blanks Note: A = Acceptable	<u>X.</u>	System Performance			N		_			
Note: A = Acceptable ND = No compounds detected N = Not provided/applicable SW = See worksheet FB = Field blank EB = Equipment blank Validated Samples: 1 JP-M06-GWMW123R 11 JP-M06-GWMW652 21 JP-M07-GWMW124R 12 JP-M08-GWMW652Dt 22 32	XI.	Overall assessment of data			A	2.4-				
Note: A = Acceptable ND = No compounds detected N = Not provided/applicable SW = See worksheet FB = Field blank EB = Equipment blank Validated Samples: 1 JP-M06-GWMW123R 11 JP-M06-GWMW652 21 JP-M07-GWMW124R 12 JP-M06-GWMW852Dt 22 32	XII.	Field duplicates			SW 1	FD =	<u>- 1</u>	,7 FD2=11,	15	
N = Not provided/applicable SW = See worksheet R = Rinsate FB = Field blank Validated Samples: TB = Trip blank EB = Equipment blank YAND TB = Trip blank EB = Equipment blank YAND 1 JP-M06-GWMW123R 11 JP-M06-GWMW652 21 JP-M07-GWMW124R 12 JP-M06-GWMW852Dt 22 32	XIII.	Field blanks			NX	SB	_	,		
2 JP-M07-GWMW124R 12 JP-M08-GWMW852 Dt 22 32		N = Not provided/applicable SW = See worksheet	•	R = Rin	isate ield blank			TB = Trip blank	olank	
2 JP-M07-GWMW124R 12 JP-M08-GWMW852 Dt 22 32	1 .	IP-M06-GWMW123R	11	JP-M06-GWI	MVV652	21	T	146956 MB	31	
						22	J		32	
		JP-M06-GWMW162R	13	JP-M06-G₩	MW652DL2	23	T		33	

1	JP-M06-GWMW123R	11	JP-M06-GWMW652	21	146956 MB	31	
2	JP-M07-GWMW124R	12	JP-M08-GWMW652DŁ	22	· · · · · · · · · · · · · · · · · · ·	32	
3	JP-M06-GWMW162R	13	JP-M06-CWMW652DL2	23		33	
4	JP-M06-GWMW212R	14	JP M06 CWMW652DL3	24		34	
5	JP-M06-GWMW212RDL	15	JP-M06-GWMW994	25		35	
6	JP-M06-GWMW212RDL2	16	JP-M06-GWMVV994DL	26		36	
7	JP-M06-GWMW995	17	JP-M06-GWMW994DL2	27		37	
8	JP-M06-GWMW313	18	JP-M06-GWMW994DL3	28		38	
9	JP-M06-GWMW318	19	JP-M06-GWMW994DL4	29		39	
10	JP-M06-GWMW319	20		30		40	

Notes:____

VALIDATION FINDINGS WORKSHEET

GC HPLC METHOD:

	(V				
8310	(8330)	8151	8141	8141(con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotoluene	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Famphur	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Phosmet	
O. Phenanthrene	O. Nitroglycerin		O. Chlorpyrifos	JJ. Tetrachlorvinphos	
P. Pyrene	ď		P. Fenthion	KK. Demeton (total)	
Ö	Ø		Q. Parathion-ethyl		
œ			R. Trichlornate		
Ś			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes:

LDC #: 27649640

VALIDATION FINDINDS WORKSHEET Surrogate Recovery

Page: Lof

METHOD: GC / HPLC
Are surrogates required by the method? Yes / or No

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Were surrogates spiked into all samples and blanks? YN N/A N/N/A

Did all surrogate recoveries (%R) meet the QC limits?

Sample ID	Column 2. D.4	Surrogate Compound		%R (Limits)	C	Qualifications	ns
4	PW FF	4_		Q Q	54-148	No Qual.	
2X)				301		JP dets.	
(x000'01-X0al)						No Qual	
(100x-5-x00)		 ->	1-1-		\ \rightarrow \rightarrow \ \rightarrow \ \rightarrow \ \rightarrow \ \rightarrow \ \rightarrow \ \rightarrow \ \rightarrow \ \rightarrow \rightarrow \ \rightarrow \rightarrow \ \rightarrow \rightarrow \rightarrow \rightarrow \rightarrow \ \rightarrow \rig		
			_)			
)			
			$\left \cdot \right $)) (
			-		(
			-)			
			-				
Surrogate Compound	ns	Surrogate Compound		Surrogate Compound	, constant		
Chlorobenzene (CBZ)	9	Octacosane	Σ	Benzo(e)Pyrene	S 1-Chloro-3	1-Chloro-3-Nitrohenzene	Tetrachloro-m. vylane
4-Bromofluorobenzene (BFB)	I	Ortho-Terphenyl	z	Terphenyl-D14	_	4	2-Digitte Benizerie
a,a,a-Trifluorotoluene	-	Fluorobenzene (FBZ)	0	Decachlorobiphenyl (DCB)	U Trip		
Bromochlorobenene	7	n-Triacontane	۵	1-methylnaphthalene	V Tri-n-	Tri-n-propyltin	
1,4-Dichlorobutane	*	Hexacosane	σ	Dichlorophenyl Acetic Acid (DCAA)	W Tributyl	Tributyl Phosphate	
1.4-Difluorobenzene (DFB)		Bromobenzene	Ж	4-Nitrophenol	X Tripheny	Triphenyl Phosphate	

73	
क्री	
H H	
#	‡
DC.	

Compound Quantitation and Reported CRQLs VALIDATION FINDINGS WORKSHEET

Reviewer: # 2nd Reviewer:

Page: 1 of 1

GC _HPLC METHOD:

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A

Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Did the reported results for detected target compounds agree within 10.0% of the recalculated results? Did the percent difference of detected compounds between two columns./detectors <40%? If no please see findings bellow.

Qualifications	Jante /A										>	
%D Between Two Columns/Detectors Limit (≤ 40%)	1(3.0	-	2.7	7:00	1.9.6.1	1-9-1	129.6	67.5		71.9	57.2	
Sample ID	3		7		d	→	01	1	- Andrews - Andr	(5	→	
Compound Name	Ь	-	± +	4	7	h	J	Ħ		#	Z	
#												

Comments:

LDC#: 27649C40

VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

Page: 1_of1 Reviewer: AA 2nd Reviewer: -

METHOD: HPLC Explosives (EPA SW 846 Method 8330)

YN NA YN NA Were field duplicate pairs identified in this SDG? Were target analytes detected in the field duplicate pairs?

	Concentration	on (ug/L)	(s 2 5)	(ug/L)	Qualifications
Analyte	11	15	RPD	Difference	(Parent Only)
D	9.5	7.9		1.6 (limit580)	No Qual.
G	1600	1300	21		1
J	8400	6800	21		
K	3300	2700	20		
工	360	320	12		
Н	380	320	17		

	Concentration	on (ug L)	(≤ 25)	(uglL)	Qualifications
Analyte	((15	RPD	Difference	(Parent Only)
L	44000	35000	23		No Qual
N	28000	22000	24		4
			···		
-					